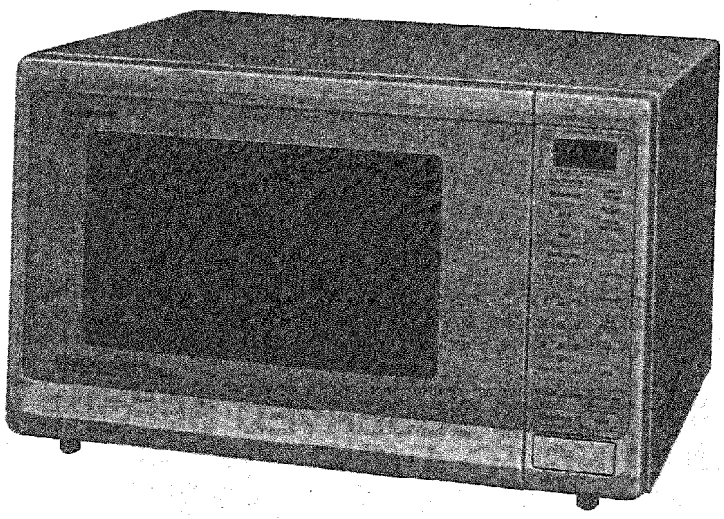
ORDER NO. CAD9407774C5
E1

Service Manual

Microwave Oven

MODEL	APH	CPH	PPJ
NN-9804	○	○	—
NN-9854	○	○	—
NN-9854P	—	—	○

APH···For U.S.A., Puerto Rico and Latin America (120V Area)
CPH···For Canada
PPJ···For U.S.Military Market (PX)



Specifications

		APH/CPH	PPJ
Power Source:		120 V AC, 60 Hz	120 V AC, 50/60 Hz
Power Requirement:	Microwave	1,500 W	
	Heater	1,500 W	
Output:	Microwave	850 W : Full Power (IEC 705-88)	
	Heater	1,400 W	
Microwave Frequency:		2,450 MHz	
Timer:		99 min. 99 sec. /9 hr. 99 min.	
Outside Dimensions:		14-13/16" (H) × 23-7/8" (W) × 19-5/16" (D) 376 mm (H) × 606 mm (W) × 491 mm (D)	
Oven Cavity Dimensions:		9-1/2" (H) × 16-1/4" (W) × 16-13/16" (D) 242 mm (H) × 412 mm (W) × 426 mm (D)	
Weight:		Approx. 58 lbs/26 kg	
Specifications subject to change without notice.			

Panasonic®

1994年 10月 7日

承認	検印	作成

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J" (D.H.H.S.): U.S.A. models
   or "Radiation Emitting Devices Act" (Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
4. If the unit cannot be repaired on site, advise the customer not to use until unit be repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A. (MSC)	Matsushita Services Company 50 Meadowland Parkway, Secaucus, New Jersey 07094 Attention: Technical Service Division. (201) 348-7000	IN PUERTO RICO (PSC)	PSC San Gabriel Industrial Park 65th Infantry Ave. Km.9.5 Carolina, Puerto Rico 00985 (809) 750-4300
		IN CANADA (MELCA)	Matsushita Electric of Canada Limited 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905) 624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.
(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation
   (2) Proper door closing
   (3) Seal and sealing surfaces (arcing, wear, and other damage)
   (4) Damage to or loosening of hinges and latches.
   (5) Evidence of dropping or abuse
(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.
(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

(APH/CPH)

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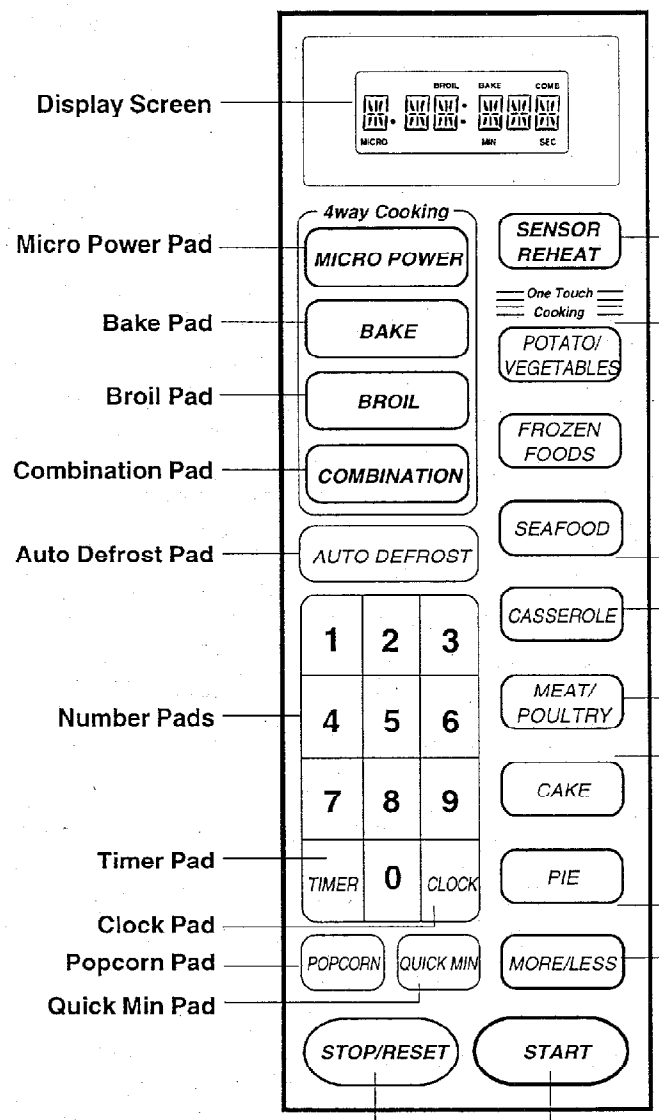
FEATURE CHART

FEATURE		NN-9804/9854/9854P MQC1548H
Three Stage Cooking		○
Sensor Reheat		○
One Touch Cooking	Sensor Cook by Microwave	○
	Sensor Cook by Combination	○
	Weight Cook by Combination	○
	Auto Cook by Bake	○
Auto Defrost		○
Bake		○
Broil		○
Combination		○
Popcorn		○
Quick Minute		○
Child Safety Lock		○
Operating Guide on the Display		○
Timer/Stand Time		○
Digital Clock		○

CONTROL PANEL



Stop/Reset Pad:
Before cooking: One tap clears your instruction.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day appears on display screen.

Start Pad:
One tap allows oven to begin functioning. If door is opened or Stop/Reset Pad is pressed once during oven operation, Start Pad must be pressed again to restart oven.

Prompters:
When pads are pressed, a beep sound is heard and the corresponding letter or word(s) appear and roll across the screen. If a pad is pressed and no beep is heard, the unit has not, or cannot, accept the instructions. Words will automatically appear to prompt user to perform the next step. It is not necessary to wait for the words to appear before pressing pads for the next step. A two beep sound is heard between stages. At the end of any complete program, the oven will beep five times.

OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

Conversion:
The display automatically appears in English with weight/ temperature measurement in imperial.
If you wish to use Spanish or French and metric system, press Start pad until the desired pair appears on the display window. The conversion should be programmed directly after plugging the oven in.

Press Start	Scroll Display
——	English/ Lb/F
once	English/ kg/C
twice	French/ kg/C
3 times	Spanish/ kg/C
4 times	Spanish/ Lb/F

Operation Guide on the display:
To assist you in programming, the next operation will appear in the display. When you get used to operate the oven, you can turn off the operation guide.

To turn off:

Timer → GUIDE OFF

Press 3 times

To turn on:

Timer → GUIDE ON

Press 3 times

1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	*WELCOME PLEASE REFER TO OPERATING INSTRUCTIONS BEFORE USE* :
2. Press Clock pad.	*SET TIME*
3. Enter time of day (TOD) by pressing appropriate Number pads.	*11:25* ——*PRESS CLOCK PAD*
4. Press Clock pad. TOD has now been resistered into the digital programmer circuit and will count up by minutes.	*11:25*

2. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Place a water load in the oven.	
2. Press Micro Power pad once to set High power. (1st stage)	*HIGH* ——*SET TIME*
3. Set for 5 seconds by pressing Number pad.	*5* SEC ——*PRESS START* *HIGH*
4. Press Micro Power pad 4 times to set Medium power. (2nd stage)	*MEDIUM* ——*SET TIME*
5. Set for 1 minute by pressing Number pad.	*1 00* MIN SEC ——*PRESS START* *MEDIUM*
6. Press Start pad.	MICRO *5* SEC
7. When 1st stage cooking time has elapsed, oven automatically switches to 2nd stage cooking.	MICRO *1 00* MIN SEC
8. When 2nd stage cooking time has elapsed, oven beeps 5times and shuts off.	*Time of day or colon appears in the display.*

3. Auto Weight Defrost

OPERATION	SCROLL DISPLAY
1. Press Auto Defrost pad.	*AUTO DEFROST* ——*SET WEIGHT*
2. Set the weight for 3 pounds by pressing 3 0 pad.	*3.0 Lb* ——*PRESS START*
3. Press Start Pad.	MICRO *27 00* MIN SEC

4. Convection Cooking with Preheat

OPERATION	SCROLL DISPLAY
1. Press Bake pad twice.	225 F ——PRESS START
2. Press Start pad.	BAKE P
3. When preheating is completed, oven beeps 3 times.	BAKE P END
4. After completion of preheating, be sure to open the door.	225 F ——SET TIME
5. Close the door and set convection cooking time for 2 minutes.	H 2 ——PRESS START 225 F
6. Press Start pad.	BAKE 2 00 MIN SEC

5. Auto Sensor Cooking

NOTE: Make sure that the outer panel is installed before Auto Sensor Cooking Test, since Auto Sensor function does not operate properly without the outer panel.

OPERATION	SCROLL DISPLAY
1. Pour 150 ± 15cc (4.5 ± 1/2 ozs) of room temperature water in a beaker, securely cover the top of the beaker with plastic wrap and place the beaker in the center of the oven.	COVER THE TOP OF THE BEAKER WITH PLASTIC WRAP
2. Press one touch cooking Sensor Reheat pad.	SENSOR REHEAT ——PRESS START
3. Press Start pad.	AUTO MICRO
4. The humidity sensor detects steam about 1.5 to 3.5 minutes after the Start Pad is pressed. Auto Sensor Cooking (T1) automatically switches to time cooking (T2). "AUTO" disappears with beep sounds and the remainder of cooking time appears in display window. NOTE: Cooking time will vary depending on the water temperature, the shape of beaker or the power source voltage. NOTE: K factor for SENSOR REHEAT program is 0.3.	18 SEC MICRO 54 SEC MICRO NOTE: If 18 to 54 appears, AUTO SENSOR FUNCTION is normal.
5. When the balance of cooking time has elapsed, oven stops and beeps 5 times.	• TOD reappears in the display window.

6. To Set Child Safety Lock

OPERATION	SCROLL DISPLAY
1. Press Start pad 3 times continuously. "Lock" appears in the display.	LOCK

7. To Cancel Child Lock

OPERATION	SCROLL DISPLAY
1. Press Stop/Reset pad 3 times continuously. Time of day or colon appears in the display.	11:25

8. Demonstration Mode

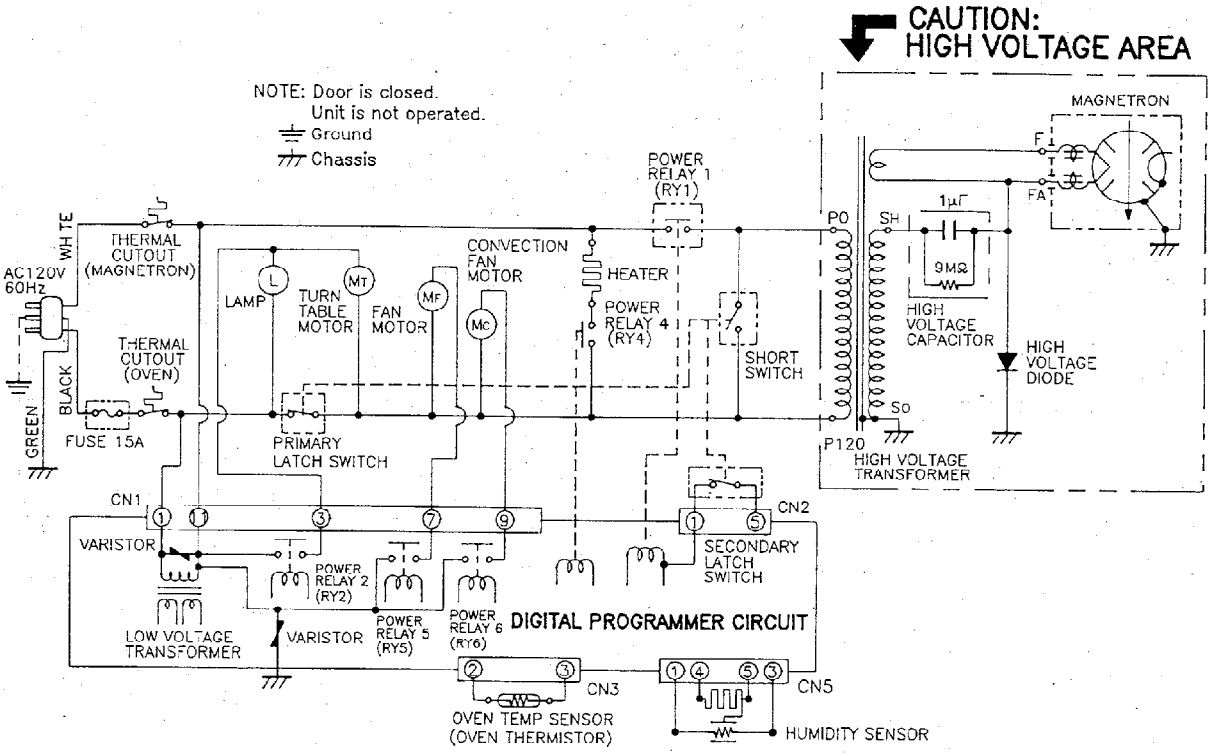
The demonstration mode designed for retail store display. It is not designed for home use. Cooking will not operate during demonstration mode.

To set demonstration mode

OPERATION	SCROLL DISPLAY
1. Press Clock pad 3 times continuously. Note: To cancel demonstration mode, press Clock pad 3 times continuously.	DEMO MODE ——PRESS ANY KEY

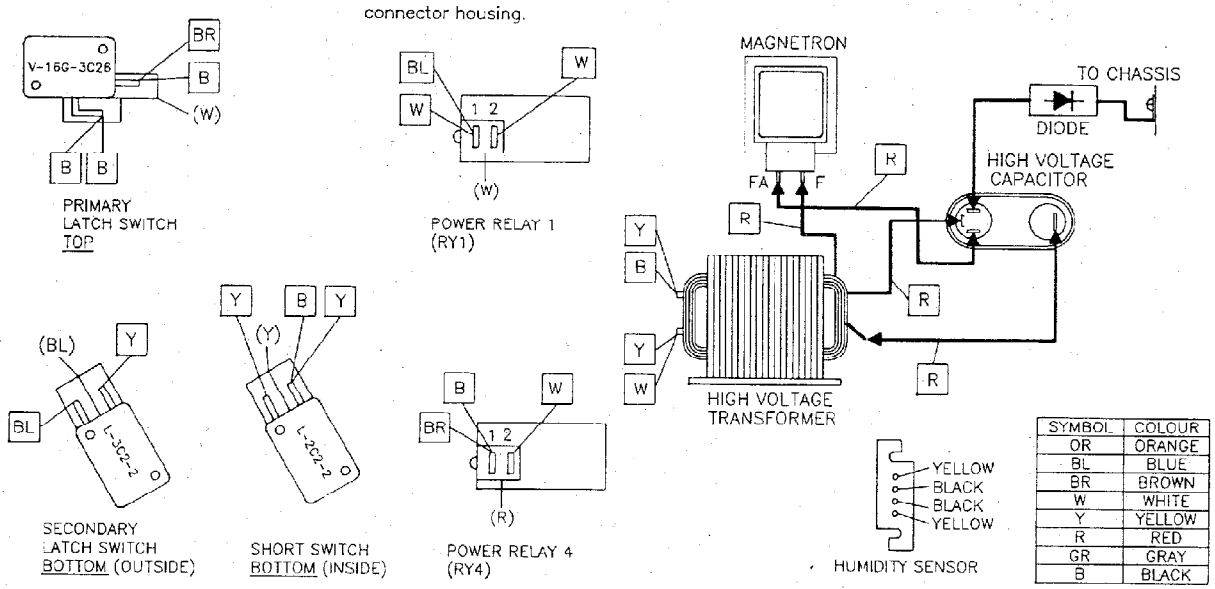
SCHEMATIC DIAGRAM

APH, AQH



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
*Colours shown by ( ) indicate colours of lead wire connector housing.

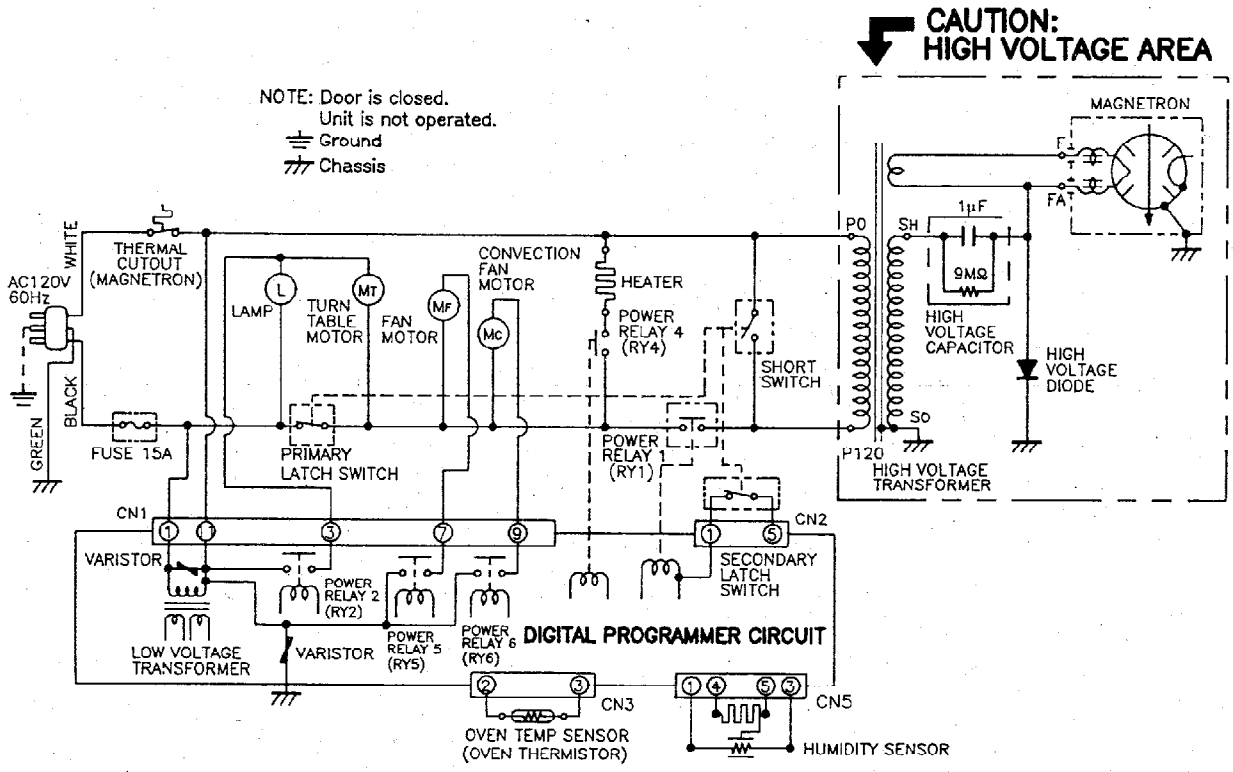


SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-667 AP/AQ
85-001

SCHEMATIC DIAGRAM

CPH, CQH



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
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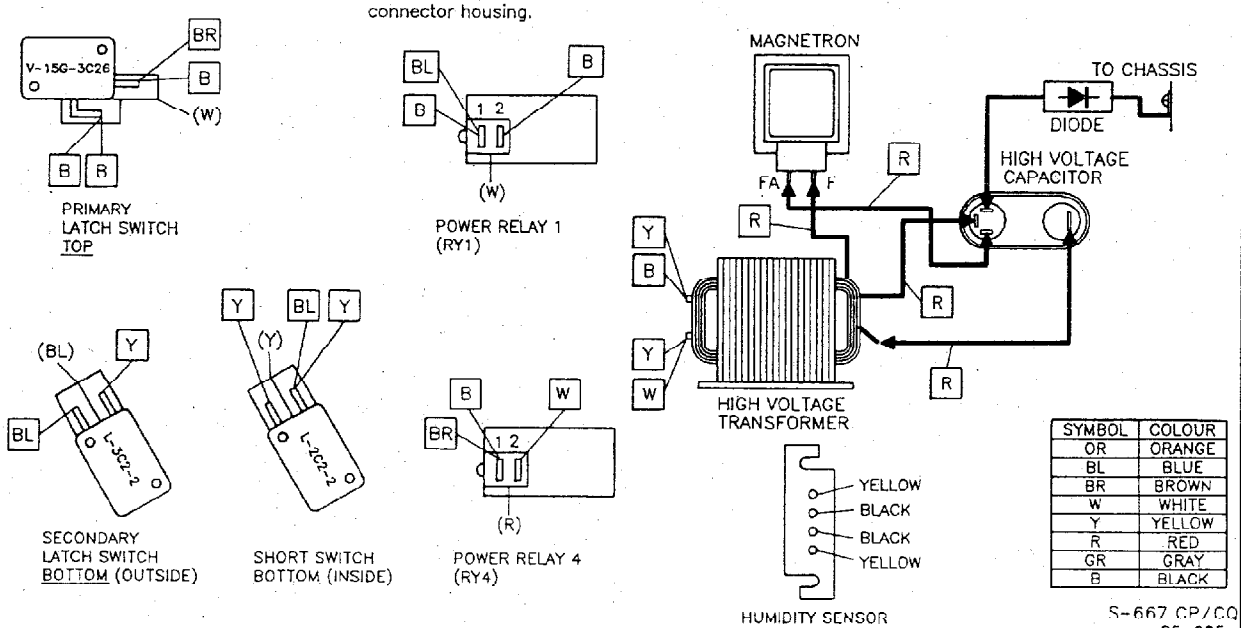
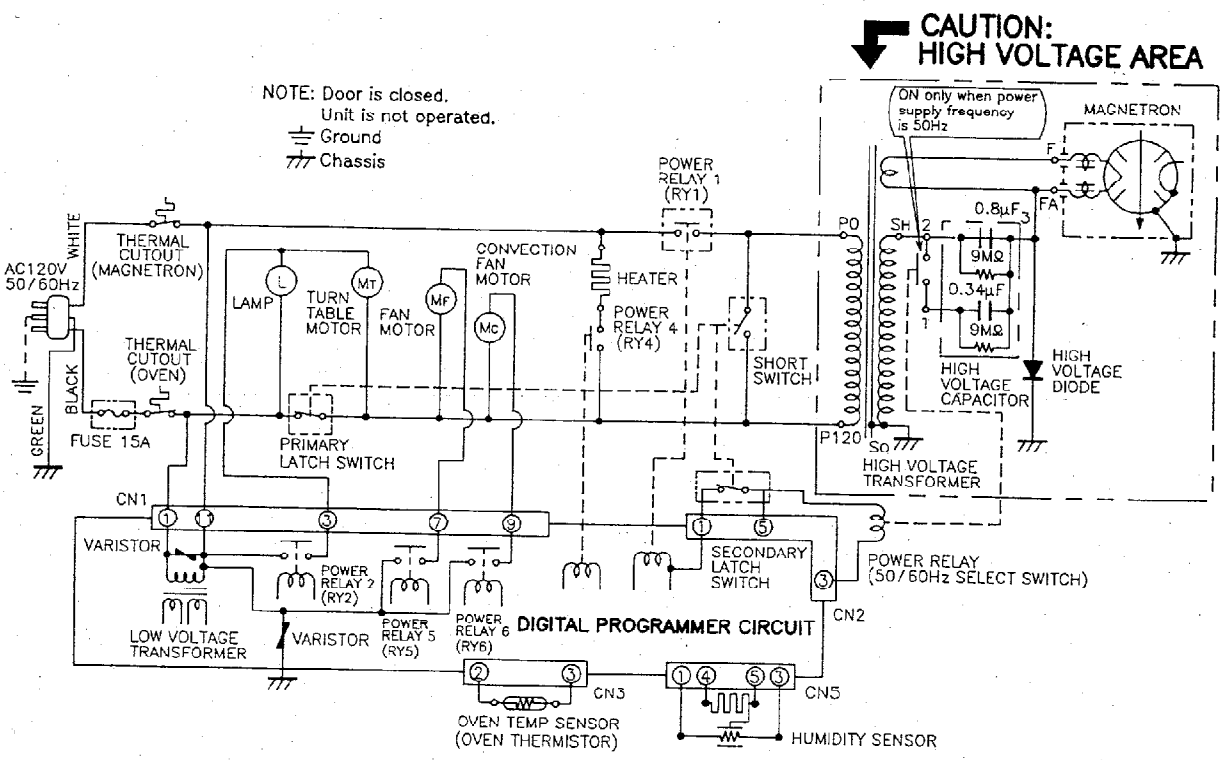


SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-667 CP/CQ
85-005

SCHEMATIC DIAGRAM

PPJ



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
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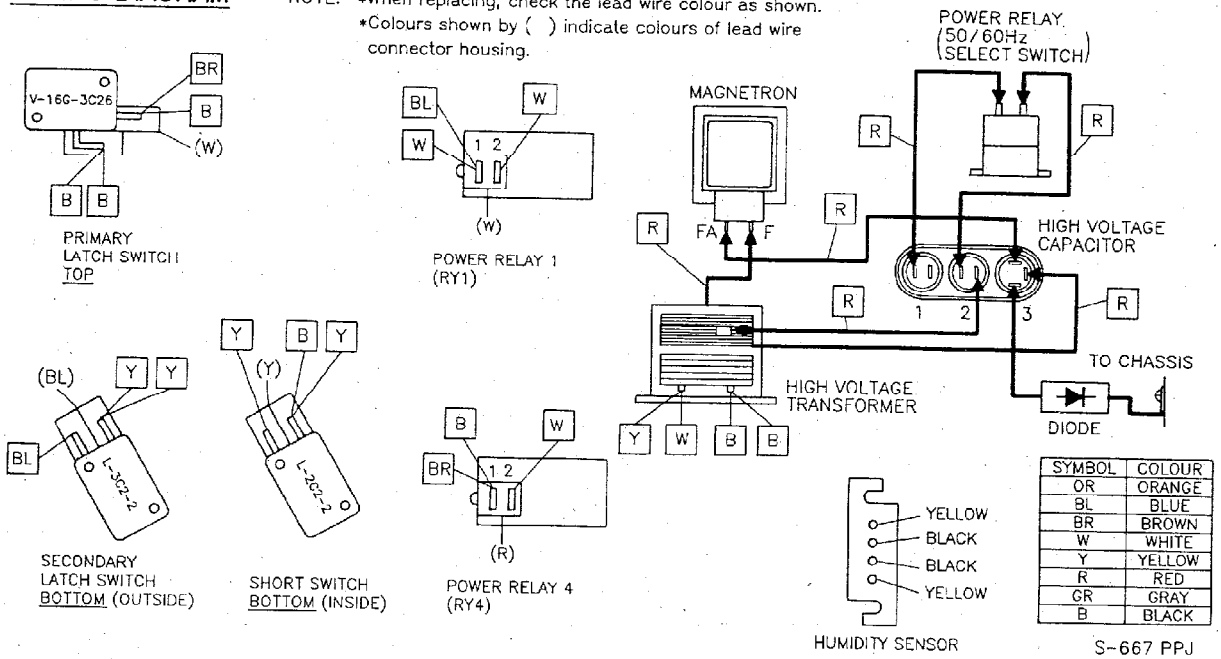


SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-667 PPJ
85-006

DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay 1 (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay 1 contacts in order to vary the output power of the microwave oven from "LOW" to "High" power. One complete ON and OFF cycle of power relay 1 is 22 seconds.
The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

POWER SETTING	ON-OFF TIME OF POWER RELAY 1 (RY1)	
	ON(SEC)	OFF(SEC)
HIGH (850W)	22	0
MEDIUM-HIGH (600W)	17	5
MEDIUM (440W)	13	9
MEDIUM-LOW (250W)	8	14
LOW (135W)	5	17
DEFROST (250W)	8	14

2. Auto weight defrost

When auto weight defrost is selected and the Start Pad is tapped:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window.
Table shows the corresponding cooking times for respective serving by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by a controll signal from the digital programmer circuit.

Auto Weight Defrost

WEIGHT SELECTED	TOTAL DEFROSTING TIME
1 lb	9 min. 00 sec.
3 lb	27 min. 00 sec.

3. Bake/Broil cooking control

The digital programmer circuit controls the ON-OFF time of the heater in order to control oven cavity temperature.

(A) After the start pad is tapped with the desired Bake/Broil program set, an 18V DC signal comes out of the digital programmer circuit and is applied to coil of power relay 4 (RY4).

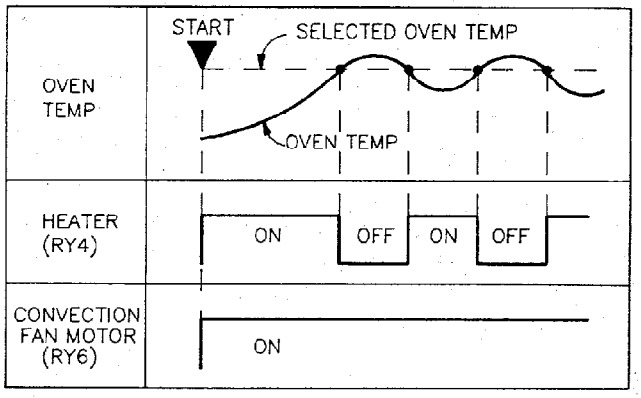
(B) When the contacts of power relay 4 close, power source voltage (120V AC) is applied to the heater and the heater turns on.

(C) When the oven temperature reaches the set temperature, the digital programmer circuit senses the temperature through oven temp sensor and stops supplying an 18V DC signal to the coil of power relay 4 and the heater turns off.

(D) After the heater turns off, the oven temperature will continue increasing a while and then decrease as shown in Figure. When the oven temperature drops below the set temperature, the digital programmer circuit senses the signal and starts supplying an 18V DC signal to the coil of power relay again.

NOTE: When Broil feature is selected, oven temperature is determined automatically as shown in Figure.

Bake Cooking



Broil Cooking

CATEGORY	OVEN TEMP
Broil	450°F

4. Combination cooking control

Combination cooking is accomplished by microwave and convection cooking being done alternately during one combination cooking cycle. One combination cooking cycle is 22 seconds.

(A) During combination cooking, the digital programmer circuit controls ON-OFF time of both power relay 1 and 4 as shown in Figure.

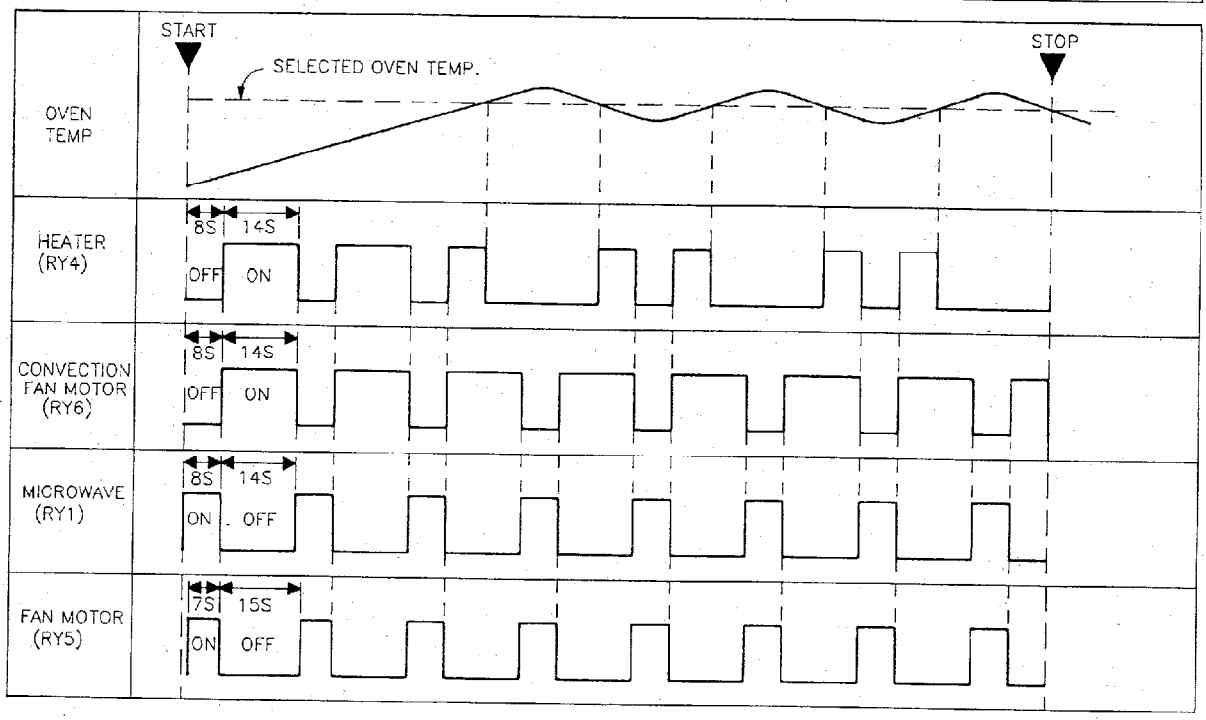
(B) When the power relay 1 (RY1) is turned on, heater turns off and after the power relay 1 turns off, power relay 4 turns on.

NOTE 1: Note that the heater may not be on during a heater on period if the preprogrammed oven temperature has been reached. This is due to the fact that the oven is keeping the preprogrammed oven temperature constant, so of course the heater will only be on when it is needed and off when it is not needed.

NOTE 2: As for temperatures of combination cooking for convection, the temperatures by each program are preprogrammed in the microprocessor as shown in Figure.

Combination Cooking

CATEGORY	MICROWAVE	HEATER	OVEN TEMP
1	8/22 SEC	14/22 SEC	275°F
2	8/22 SEC	14/22 SEC	300°F
3	8/22 SEC	14/22 SEC	325°F
4	8/22 SEC	14/22 SEC	375°F



5. One Touch Cooking (Weight Cook by Combination, Auto Bake)

When the Auto Control, Cooking feature is selected by tapping the appropriate key pads and Start pad is tapped.

(A) The digital programmer circuit determines the power level, oven temperature and combination, bake cooking time to complete cooking and indicates the operating state in the display window.
Table shows the combination cooking times for respective weights.

(B) When the cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

MENU	WEIGHT	COOKING TIME
BEEF-MEDIUM	1 LB	16 min. 50 sec.
CAKE 1	———	32 min. 00 sec.
FROZEN PIE	———	55 min. 00 sec.

6. One touch Auto sensor cooking

MENU
Sensor Reheat, Potato, Vegetables, Frozen Vegetables, Frozen Entree, Frozen Dinner, Fish, Shellfish, Casserole

Auto sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time.
All that is necessary is to select an Auto sensor Program before starting to cook.

Understanding of Cooking

As food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, a carefully designed instrument, called the humidity sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.

Explanation of the Auto Sensor Cooking process

1) The shaded columns in Figure indicate when the humidity sensor heater is on.

2) During the 30 second period there is no microwave activity. When calculating the T2 time by using the formula below, make sure this 30 seconds is subtracted from the T0 time.

3) T1 time·····T0 time — 30 seconds

4) T2 time·····When the steam escapes from the cooking container placed in the oven, the humidity sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

T2 time (in sec.) =T1 time × K factor

NOTE: Remember, the T1 time starts after the Start pad is tapped. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

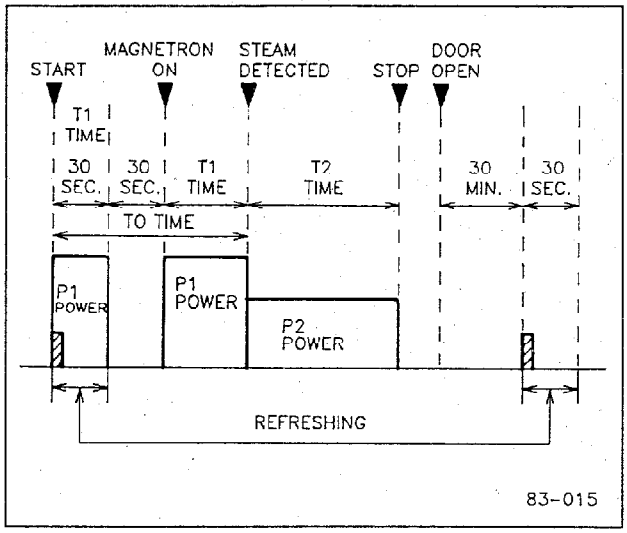
NOTE: When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

NOTE: For T2 time of Category Casserole, HEATER operation is programmed.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds, and the Auto Sensor program selected is Sensor Reheat.

T2 = T1 × K
= 2 min. and 40 sec. × 0.3
= 48 sec.



Auto Sensor Cook

Category	P1 Power	P2 Power	K factor Standard
Sensor Reheat	HIGH	HIGH	0.3
Frozen Entree	M. HIGH	M. HIGH	0.6
Casserole	HIGH	M. LOW MICROWAVE: 8S HEATER: 14S	4.0

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. When the 15 Amp fuse is blown due to the operation of short switch:

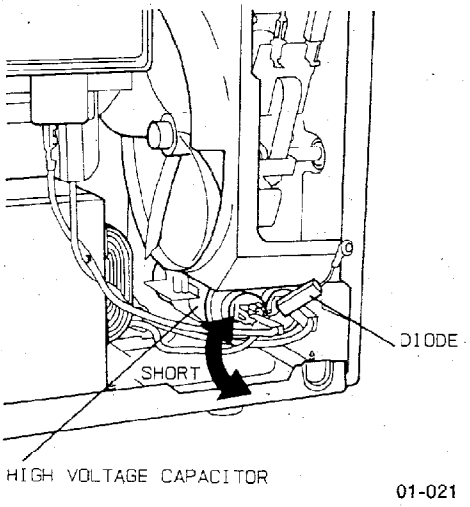
WARNING

When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 1 (RY1) when the continuity check reads shorted contacts (1-2).

(A) This is mandatory. Refer to "Adjustments and Measurement" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



01-021

Touch chassis side first then short to the high voltage capacitor terminal.

6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.
(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
(C) Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage.)

DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

1. Magnetron

(A) Discharge the high voltage capacitor.

(B) Remove 2 screws holding air guide A.

(C) Remove 2 screws holding thermal cutout.

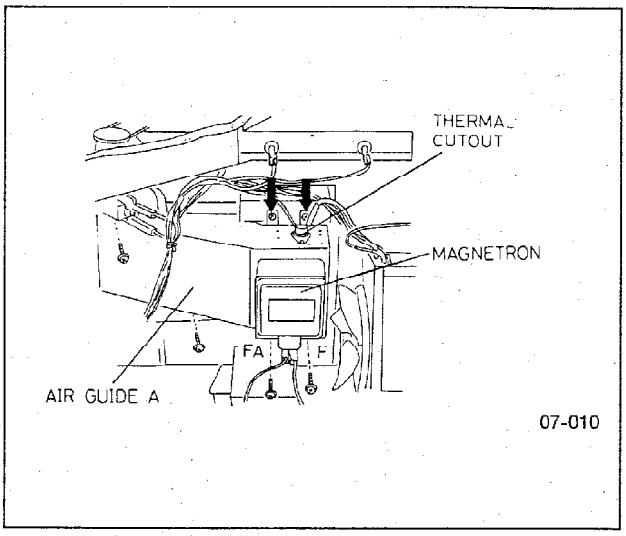
(D) Disconnect 2 high voltage lead wires from the magnetron filament terminals.

(E) Remove the 4 screws holding the magnetron.

NOTE: After replacing the magnetron, tighten all mounting screws properly making sure there is no gap between the waveguide and the magnetron, this will prevent microwave leakage.

CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".



2. Digital programmer circuit (DPC) and membrane key board.

NOTE: Be sure to ground any static electric charge built up on your body, before handling the DPC.

(A) Disconnect all connectors from D.P.C.

(B) Remove the 4 screws holding the escutcheon base and slide the escutcheon base upward slightly.

(C) Release CN4 connector's lock of the DPC by pushing both levers to inside and pull them upward, and remove the flat cable of membrane key board.

(D) Remove 3 screws holding DPC.

To replace membrane key board

(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.

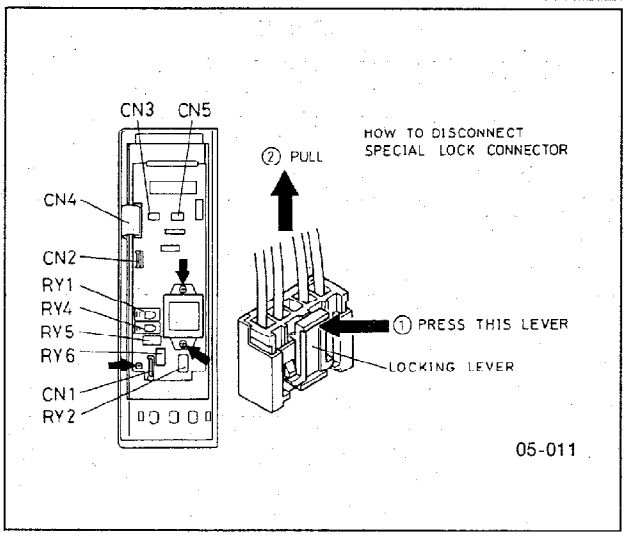
(F) Peel off the tab of membrane key board from escutcheon base.

(G) Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.

NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using of hair dryer is recommended for smoother removal.

2. When installing the new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

3. Alignment position of membrane key board is as follows (see figure);
Membrane key board : Right and upper edges
Escutcheon sheet : Right and lower edges



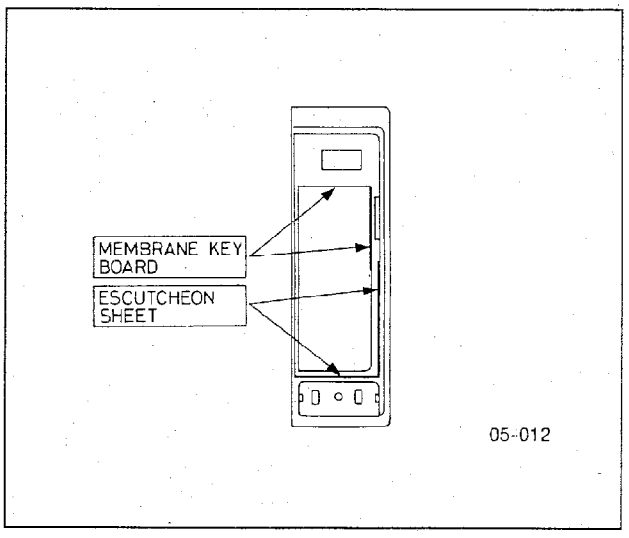
3. Low voltage transformer and/or power relays (RY1, 2, 4, 5, 6)

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.



4. Fan motor and high voltage capacitor

(A) Disconnect 2 lead wires from fan motor terminals.

(B) Disconnect 2 lead wires from fuse holder terminals.

(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.

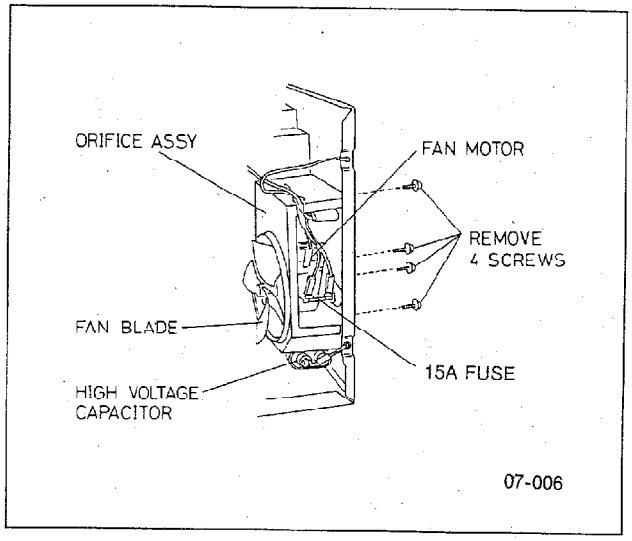
(D) Remove 4 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.

(E) Remove fan blade from the fan motor shaft by pulling it straight out.

(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.

To replace high voltage capacitor

(G) Remove 1 screw holding high voltage capacitor



5. Heater

(A) Remove lead wires from lead wire holders.

(B) Remove belt from pulleys of circulation fan.

(C) Remove 2 screws holding heater fan motor bracket.

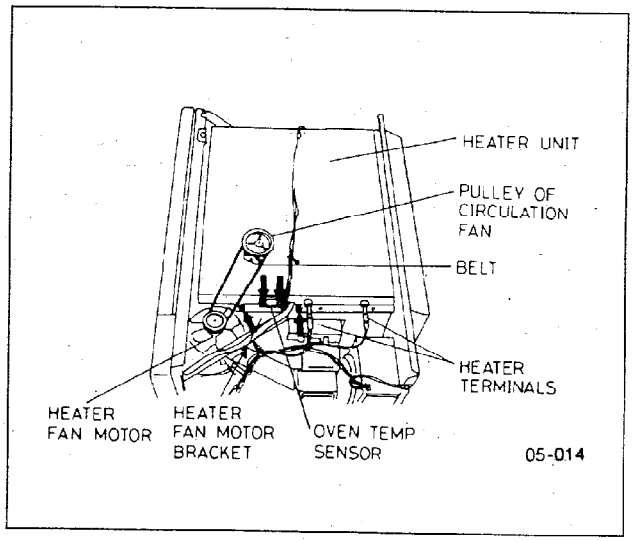
(D) Remove 1 screw holding exhaust guide.

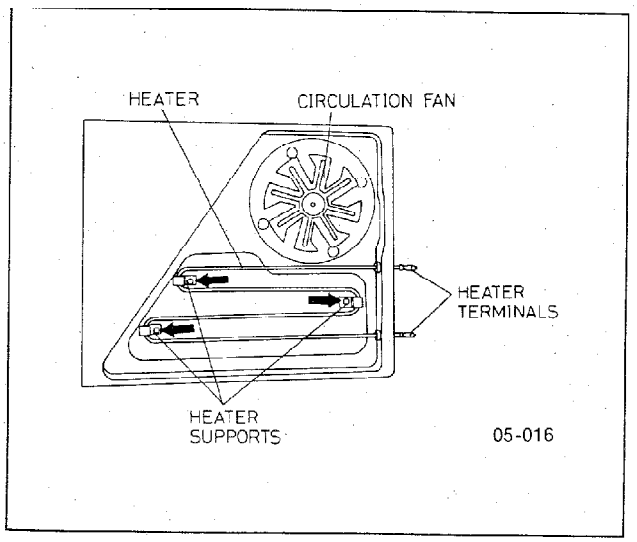
(E) Remove 2 screws holding oven temp sensor.

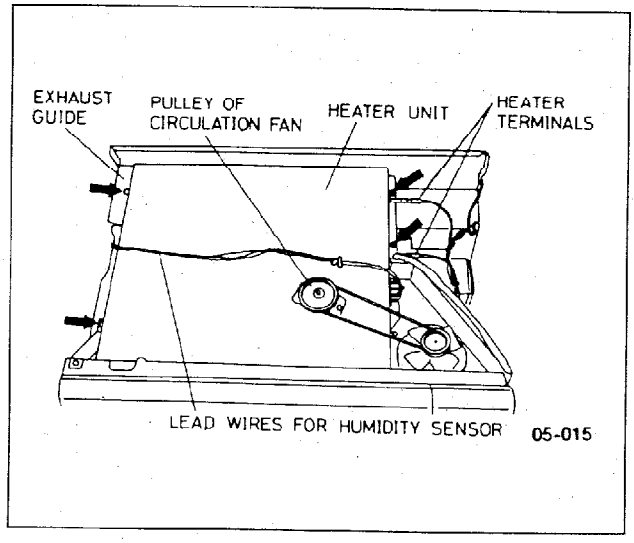
(F) Disconnect 2 lead wires from heater terminals.

(G) Remove 4 screws holding the both sides of heater unit and lift it up carefully.

(H) Remove 3 screws holding heater supports and detach the heater.







6. Door assembly

(A) Open the door and remove 4 screws holding door C.

(B) Remove the door C from door E by carefully pulling outward starting from upper right hand corner.

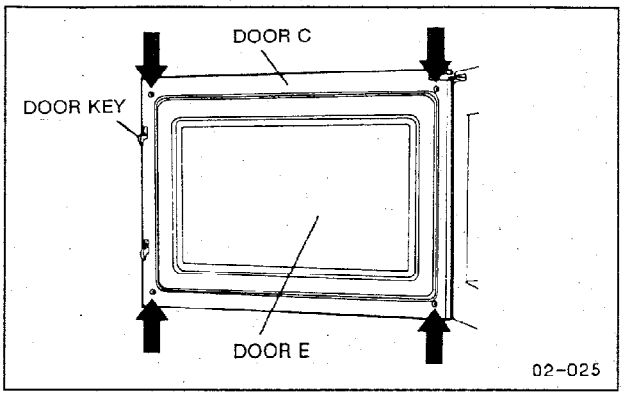
(C) Separate the door A from the door E by freeing 8 catch hooks on the door A.

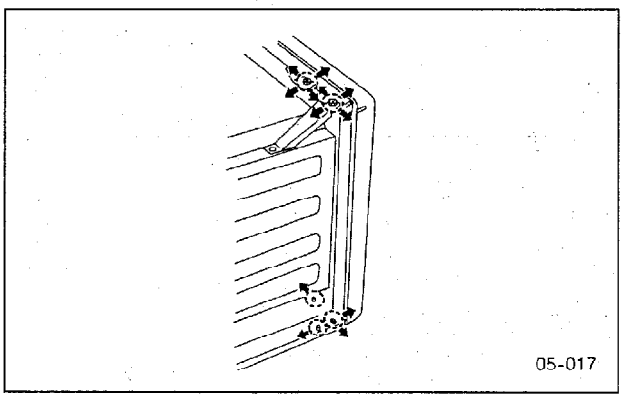
(D) Remove door key spring and door key.

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

(1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.

(2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave may leak from the clearance between the door and oven.



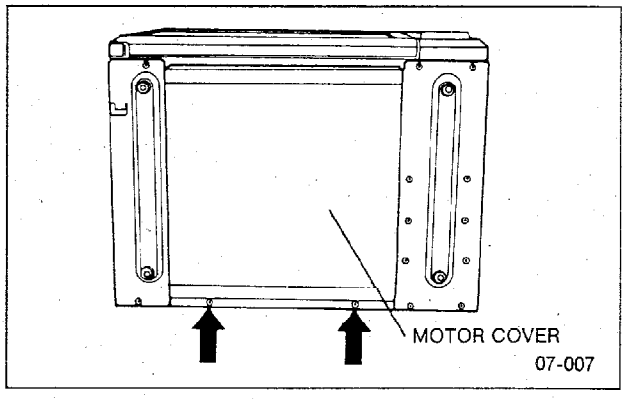


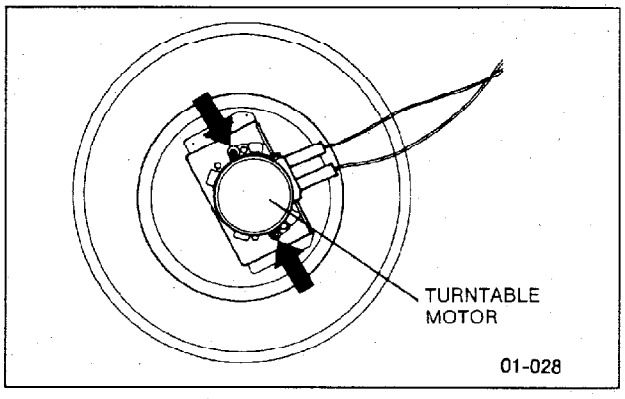
7. Turntable motor

(A) Remove 2 screws holding motor cover.

(B) Disconnect 2 lead wires from turntable motor.

(C) Remove 2 screws holding turntable motor.





COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power relay 1) Interlocks.

(A) Unplug lead connectors to Power Relay B and verify continuity of the power relay 1 (RY1) 1-2 terminals.
(B) Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
(C) Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Secondary Latch Switch	∞ Ω (open)	0 Ω (close)
Power Relay 1 (RY1)	∞ Ω (open)	∞ Ω (open)

2. Short Switch & Monitor Circuit

(A) Unplug lead wires from H.V. transformer primary terminals.
(B) Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Transformer.
(C) Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
Normal continuity readings should be as follows.

Models	Door closed	Door opened
Touch Models	∞ Ω	0 Ω

3. High voltage transformer

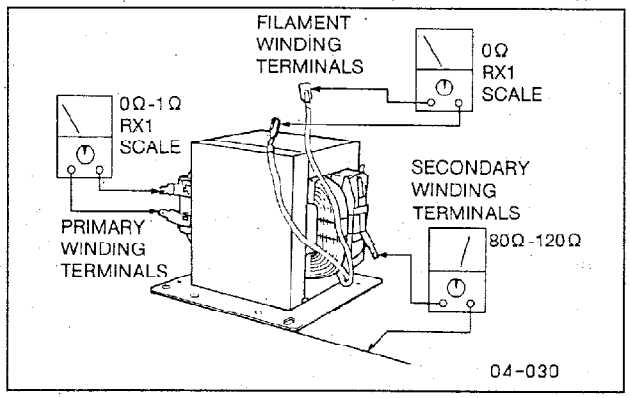
(A) Remove connections from the transformer terminals and check continuity.
(B) Normal (cold) resistance readings should be as follows:
Secondary winding ····· Approx. 80Ω~120Ω
Filament winding ····· Approx. 0Ω
Primary winding ····· Approx. 0Ω~ 1Ω

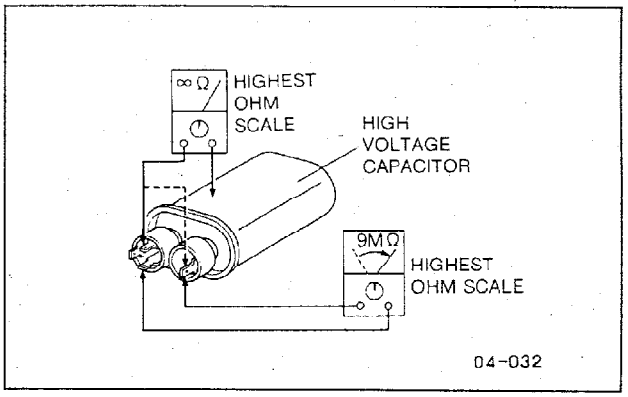
4. High voltage capacitor

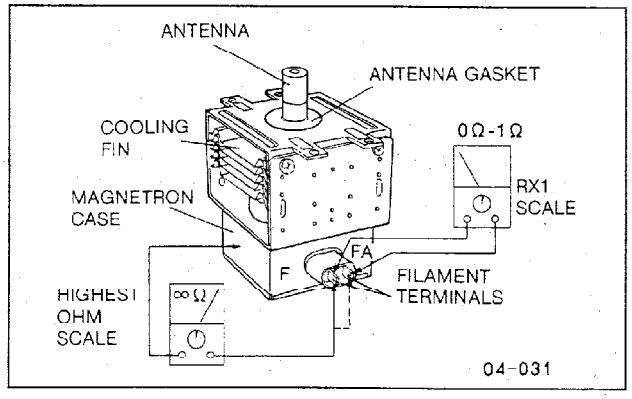
(A) Check continuity of capacitor with meter on highest OHM scale.
(B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
(C) A shorted capacitor will show continuous continuity.
(D) An open capacitor will show constant 9MΩ.
(E) Resistance between each terminal and chassis should be infinite.

5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.
(A) Isolate magnetron from the circuit by disconnecting the leads.
(B) A continuity check across magnetron filament terminals should indicate one ohm or less.
(C) A continuity check between each filament terminal and magnetron case should read open.





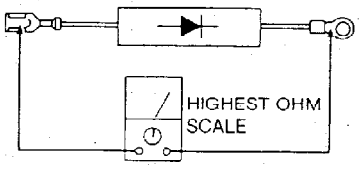


6. Diode

(A) Isolate the diode from the circuit by disconnecting the leads.

(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.

A normal diode's resistance will be infinite in one direction and several hundred kΩ in the other direction.



NOTE: OHMMETER SHOULD HAVE A MINIMUM 6 VOLT BATTERY.

FORWARD	REVERSE
SEVERAL HANDRED KΩ	∞Ω

04-033

7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

8. Humidity Sensor and digital programmer circuit

CAUTION

Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
Always ground yourself while working on this panel to discharge any static charge built up on your body.

(A) Check across sensor heater terminals. Normal cold resistance should read approx. 4.5 ohm.

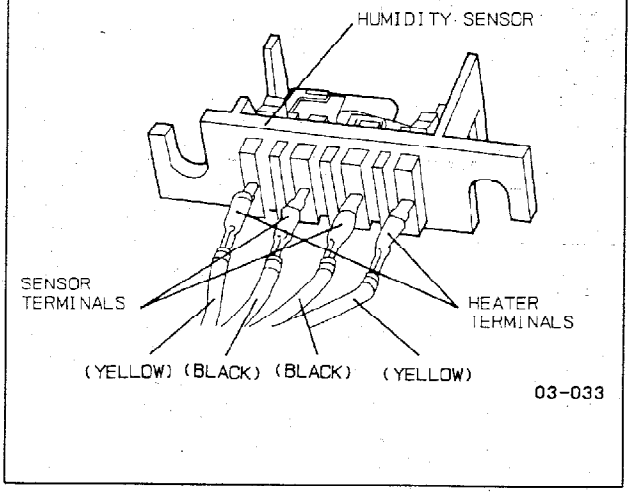
(B) In order to determine if the Auto/Humidity Sensor function of the digital programmer circuit is in working order or not, do the following test.

1) Place a water load in the oven.
2) Unsolder 2 black wires connected to sensor terminals.
3) Tap Sensor Reheat Pad to set auto sensor cooking and tap Start Pad.
4) About 10 seconds after Start Pad is touched, short 2 black wires for 5 seconds and then remove them. Before shorting the 2 black wires you can watch the sensor heater glow red.
5) Approx. 75 seconds after the Start Pad is pressed (T0 TIME), short the 2 black wires again
6) "AUTO" should disappear in display window and following digits (see chart) should appear indicating **balance of cooking time (T2 TIME).

The time should start to count down and oven should shut off when the time has elapsed.

* T0 TIME	** T2 TIME (balance of cooking time)
70 sec.~79 sec.	12 sec.
80 sec.~89 sec.	15 sec.

The Auto Sensor function in the digital programmer circuit is working in order if above condition is obtained.



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9. Oven temp sensor thermistor

This sensor monitors the heat produced by the heater circuit and maintains the oven temperature the user had selected.Normal room temperature, especially in a kitchen can vary anywhere from 50°F to 90°F. The reading across the oven sensor thermistor should be within 360K ohm to 1500K ohm when reading in an area within the 50°F to 90°F room temperature range.

If the resistance reading is out of the range stated here, the sensor is detective and must be replaced.

NOTE 1: When measuring resistance disconnect the 4-pin connector(CN3) from the DPC otherwise a false reading may be indicated.

2: If checking an oven sensor thermistor just after the microwave oven has been operating, the sensor of course won't be room temperature. In this case the sensor must be removed and allowed to cool down to the 50°F to 90°F range.

MEASUREMENTS AND ADJUSTMENTS

WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts as listed below.

Switch's		U.S.A., PX MODELS	CANADA MODELS
Primary latch switch	Part No.	ANE61424L0AG	ANE6142-F60
	Type No.	V-16G-3C26	V-15G-3C26
Secondary latch switch	Part No.	A61425180AP	
	Type No.	L-3C2-2	
Short switch	Part No.	A61785180AP	
	Type No.	L-2C2-2	

* When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 1 (Part No. AEG5J1EG12B, Type No. G5J-1-TP) when the continuity check reads shorted contacts (1—2). Then follow the adjustment procedures below.
* Interlock switch replacement — In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

1. Adjustment of Primary latch switch, Secondary latch switch and short switch

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in table.

NOTE: No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in table so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

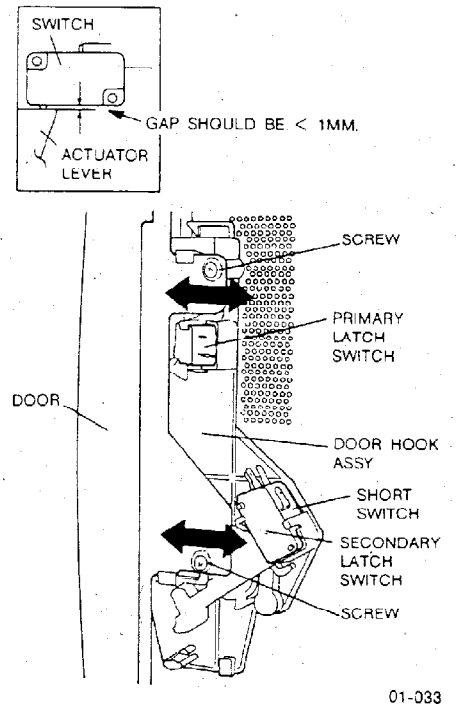
NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate. Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

(D) The normal temperature rise at High power position for each models is as shown in table.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 1.0mm when the door is closed.

TABLE (1 ℓ -1min. test)

RATED OUTPUT	TEMPERATURE RISE
850W (IEC705-88)	Min. 13.5°F (7.5°C)

PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm² (1mW/cm² for Canada) inform the MSC, PSC, or MELCA immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S and Health and Welfare Canada regulation. This required must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE: The U.S. government standard is 5 mW/cm² while in the customer's home. 2mW/cm² stated here is our own voluntary standard. (1mW/cm² for Canada)

1. Equipment

*Electromagnetic radiation monitor
*Glass thermometer 212°F or 100°C
*600cc glass beaker

2. Procedure for measuring radiation leakage.

Note before measuring

(1) Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.

(2) To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area shown in Figure no faster than 1 inch/sec (2.5 cm/sec)

(3) Leakage with the outer panel removed·····less than 5mW/cm²

(4) Leakage for a fully assembled oven with door normally closed····· less than 2mW/cm² (1mW/cm² for Canada)

(5) Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door ·····less than 2mW/cm²

(A) Pour 275 ± 15cc (9ozs ± 1/2oz) of 20 ±5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.

(B) Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.

(C) When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.

(D) Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

(1) Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING

Avoid contacting any high voltage parts.

(2) Measurements with a fully assembled oven.

After all components, including the outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

3. Record keeping and notification after measurement

(A) After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

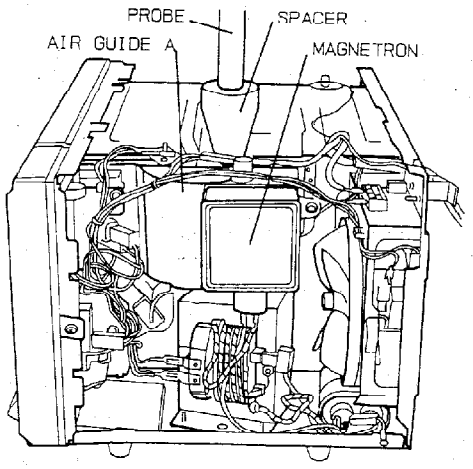
A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.

(B) Should the radiation leakage be more than 2 mW/cm² (1mW/cm² for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify the MSC, PSC or MELCA.

4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

WARNING

AVOID CONTACTING ANY HIGH VOLTAGE PARTS.



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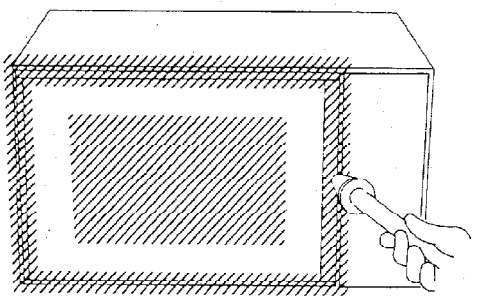


01-035

MOVE PROBE ALONG SHADED AREA (//////) AROUND EXHAUST OPENINGS (as shown) AND AROUND AIR INLET OPENING

(APH/CPH)

TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. A 120V AC is present at the shaded area ▒▒ of the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

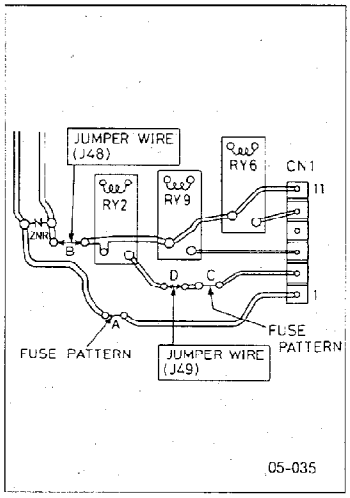
	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout (Magnetron)/(Oven) 3. Open low voltage transformer 4. Defective DPC	Check fan motor when thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. Capacitor 5. Shorted H.V. Transformer (NOTE 2)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay 1's contacts (between 1 and 2) and if it has continuity, replace power relay 1 also. NOTE 2: When H.V. Transformer is replaced, check diode and magnetron also.	
3.	Oven does not accept key input (Program)	1. Key input is not in-sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Oven lamp and turntable motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch. 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts countdown but no microwave oscillation.	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and causing magnetron to lower output and/or intermittent oscillation. 3. Defective high voltage component H.V. Transformer H.V. Capacitor H.V. Diode Magnetron 4. Open or loose wiring of power relay 1 (RY1) 5. Defective primary latch switch 6. Defective power relay 1 (RY1) or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting

	SYMPTOM	CAUSE	CORRECTIONS
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Turntable motor turns on when door is opened.	1. Shorted primary latch switch	
9.	Oven does not operate and return to plugged in mode after 1 minute elapsed in the all cooking mode.	1. Open or loose wiring of oven temp sensor 2. Defective oven temp sensor 3. Defective DPC	
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. Transformer 3. Shorted H.V. Diode	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout (Magnetron)	Adjust door and latch switches.
13.	Oven return to plugged in mode after 30 seconds elapsed in the auto sensor cooking mode.	1. Open or loose wiring of humidity sensor terminals from DPC 2. Defective humidity sensor 3. Defective DPC	
14.	Oven does not operate normally, when auto sensor cooking is selected.	1. Defective humidity sensor 2. Defective DPC	
15.	Heater does not turn on.	1. Defective heater 2. Defective power relay 4 (RY4) 3. Defective DPC	

Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern of DPC	Normal	STEP 2
			Open (NOTE)	Shorted circuit of ZNR, L. V. T., Oven Lamp etc.
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 51 voltage (Emitter of Q1)	Abnormal	ZD1,Q1
			Normal = 5V	→ Step 4
	4	IC-1 pin 12 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal (5V)	→ IC-1, CX1, DISPLAY

NOTE



Procedure of fuse pattern repairing is as follows:

1. When the fuse pattern (A) opens.

(1) Remove jumper wire (J48).
(2) Insert the removed jumper wire (J48) to "A" position and solder it. If both "A" and "B" fuse pattern are open, please replace DPC.

2. When the fuse pattern (C) opens.

(1) Remove jumper wire (J49).
(2) Insert the removed jumper wire (J49) to "C" position and solder it. If both "C" and "D" fuse pattern are open, please replace DPC.

NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

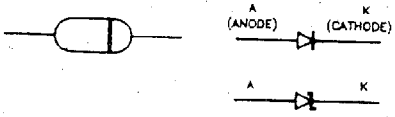
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 50 voltage	Abnormal	IC-1
			Normal	BZ
Power relay 2(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 6 voltage while operation	Abnormal	IC-1
			Normal (5V)	→ Step 2
	2	IC-3 pin 11 voltage while operation	Abnormal	IC-3
			Normal (Low level)	RY-2
No microwave oscillation at any power setting	1	IC-1 pin 8 and pin 49 voltages while operation at high power	Abnormal	IC-1
			Normal 8--- (5V), 49--- (5V)	→ Step 2
	2	Q8 transistor	Abnormal	Q8
			Normal	IC-2, RY-1

TO BE CONTINUED

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
Heater does not turn on	1	IC-1 pin 14 voltage (at operation)	Abnormal	IC-1
			Normal (5V)	→ Step 2
	2	IC-3 pin 15 voltage (at operation)	Abnormal	IC-3
			Normal (Low level)	→ STEP 3
	3	Q6 transistor	Abnormal	Q6
			Normal	IC-2, RY-4
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY
Oven stops it's operation 30 seconds after the start pad is tapped. Humidity sensor heater stay red glows for 30 sec.	1	Short circuit across the sensor terminals and check the operation	Oven operates continuously until cancel pad is tapped. Heater shut off by itself	Humidity sensor
			Still oven stops operation at 30 seconds.	C16, Q4, IC-1
Humidity sensor heater does not heat up at all	1	Heater terminals voltage	Normal AC 5-10V	Humidity sensor heater open
			No voltage	→ STEP 2
	2	LVT voltage between S1 and S2	No voltage	LVT
			Normal AC 10~20V	D25 triac,IC-1, Q3, Q9, Q10

HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode



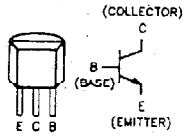
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC·····

2SD·····

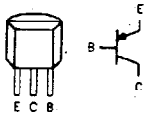


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

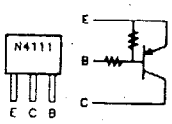
2SB·····



	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

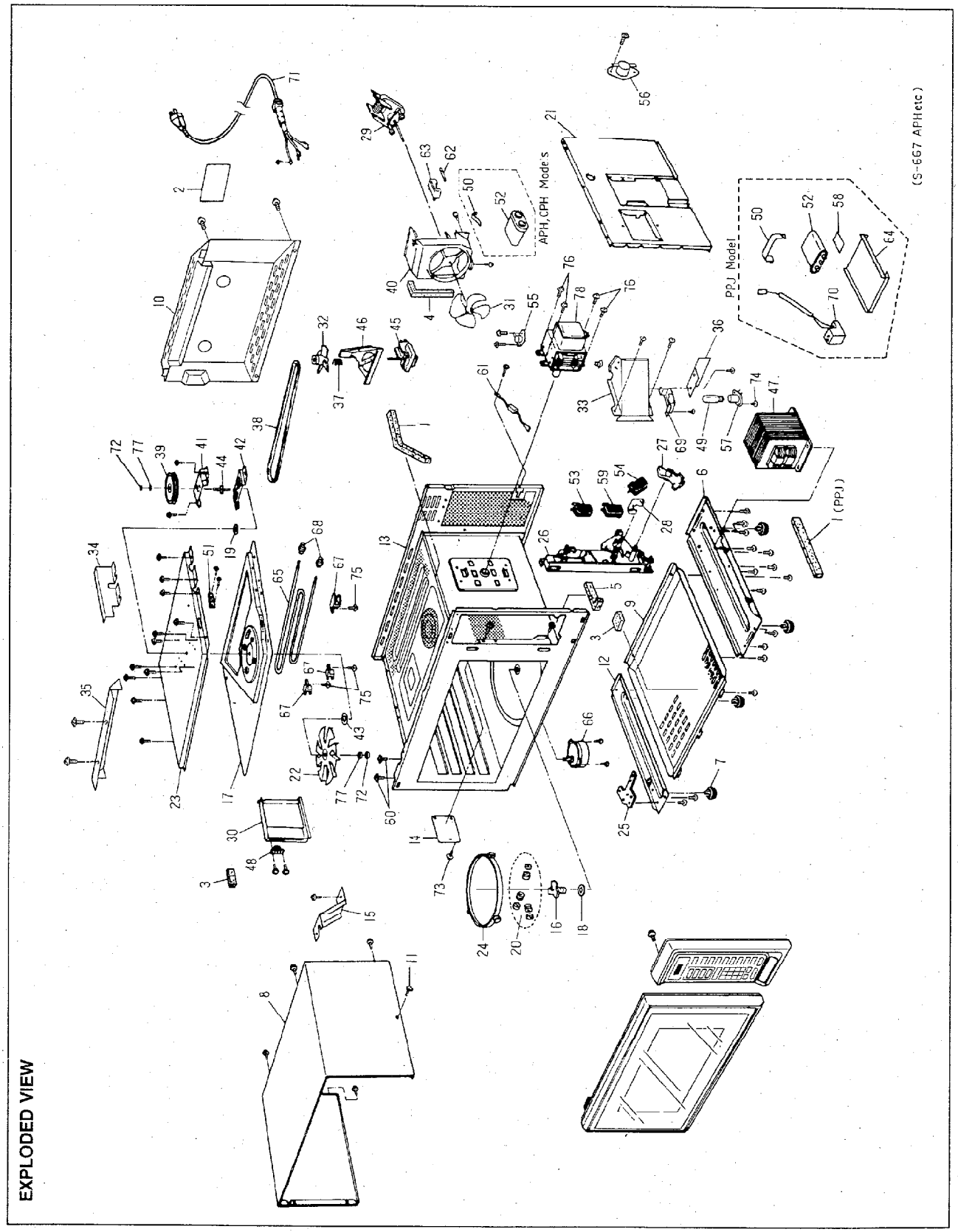
Digital Transistor

PNP Transistor

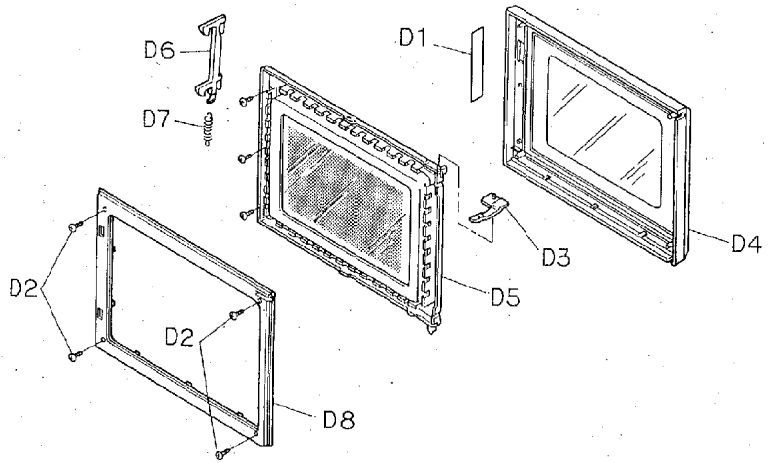


	FORWARD	REVERSE
E-B	10kΩ~30kΩ	10kΩ~30kΩ
C-B	50kΩ~90kΩ	∞
C-E	40kΩ~80kΩ	∞

EXPLODED VIEW AND PARTS LIST

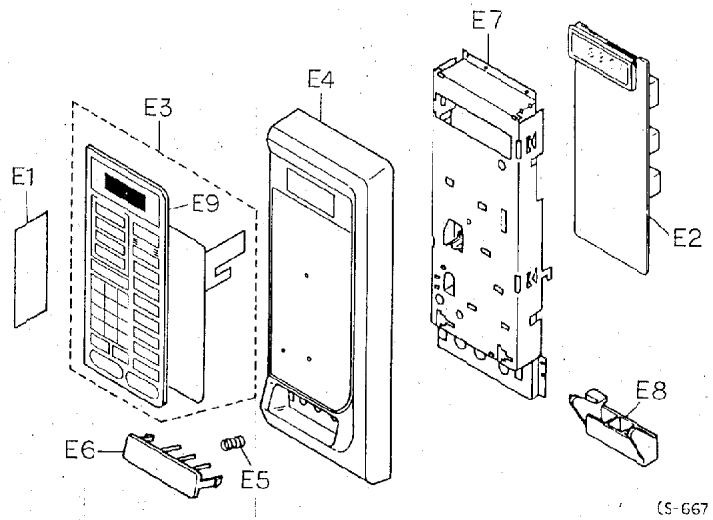


DOOR ASSEMBLY



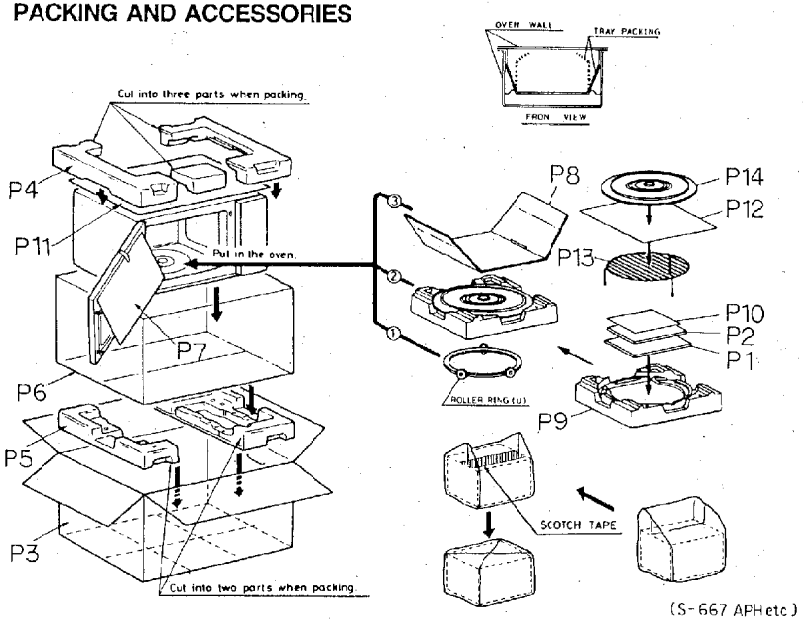
(S-667 APH etc.)

ESCUTCHEON BASE ASSEMBLY



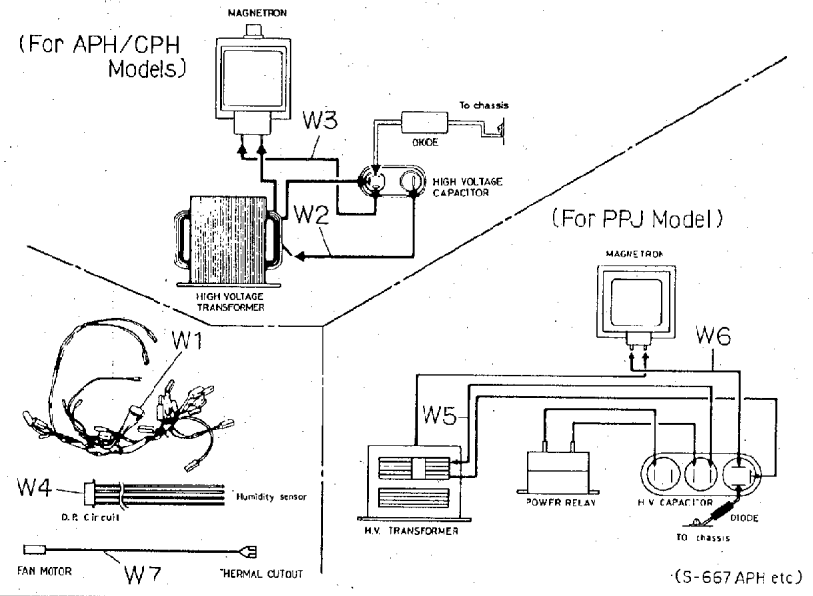
(S-667 APH etc.)

PACKING AND ACCESSORIES



(S-667 APH etc.)

WIRING MATERIAL



(S-667 APH etc.)

PARTS LIST

NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.
2: Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
1		ANE000Z000AA	CUSHION RUBBER A	1	NN-9804,NN-9854
1		ANE000Z000AA	CUSHION RUBBER A	2	NN-9854P
2		A00065820AP	CAUTION LABEL	1	NN-9804 APH,NN-9854 APH, NN-9854P
2		ANE0006R30CP	CAUTION LABEL	1	NN-9804 CPH,NN-9854 CPH
3		ANE000Z000AD	CUSHION RUBBER A	2	
4		ANE0924000AQ	CUSHION RUBBER C	1	NN-9804,NN-9854
4		ANE000Z000AB	CUSHION RUBBER C	1	NN-9854P
5		ANE0962000AD	CUSHION RUBBER D	1	
6		A10015450AP	BASE	1	
7		A10086210AP	RUBBER FOOT	4	
8		A10096670AP	CABINET BODY	1	NN-9804
8		A10096660HQP	CABINET BODY	1	NN-9854
8		A110D6670HPP	CABINET BODY (U)	1	NN-9854P
9		A10265450AP	BASE C	1	
10		A10586670AP	BACK PANEL COVER A	1	
11		XTT4+8FZ	SCREW	1	NN-9804 4X8 (FOR CABINET BODY)
11		XTT4+8DN	SCREW	1	NN-9854, NN-9854P 4X8 (FOR CABINET BODY)
12		A11295450AP	BASE B	1	
13	⚠	A200A6670AP	OVEN	1	
14		A20555450AP	COVER	1	
15		A20766660QP	REINFORCE BRACKET C	1	
16		A21315870GP	PULLEY SHAFT	1	
17		A21446660QP	UPPER PANEL	1	
18		ANE2177-F80	WASHER	1	
19		A21776660QP	WASHER	1	
20		A202K5870GP	ROLLER B (U)	1	(NOTE 3)
21		A22365450AP	RIGHT HEATER PANEL	1	
22		ANE22392L0AP	CIRCULATION FAN	1	
23		A22786660QP	UPPER HEATER PANEL	1	
24		A290D5080BP	ROLLER RING (U)	1	
25	⚠	A30076660QP	LOWER HINGE	1	
26	⚠	A30204310AG	DOOR HOOK	1	
27		A31374650AP	HOOK SPACER B	1	
28		A31384650AP	HOOK SPACER C	1	
29		A400A5160AP	FAN MOTOR	1	NN-9804,NN-9854 (AC,27W,SINGLE)
29		A400A4060PP	FAN MOTOR	1	NN-9854P (AC,30W,SINGLE)
30		A400K5040AQ	EXHAUST GUIDE	1	
31		ANE40085W0AP	FAN	1	
32		A40085020AQ	FAN	1	
33		A40256660QP	AIR GUIDE A	1	
34		A40266660QP	AIR GUIDE B	1	
35		A40316670AP	AIR GUIDE C	1	
36		A40476660QP	AIR GUIDE E	1	NN-9804,NN-9854
36		A40476670PP	AIR GUIDE E	1	NN-9854P
37		ANE4057-F50	SPRING	1	
38		A40606660QP	BELT A	1	
39		A41325020AQ	PULLEY B	1	
40		A41445020AP	ORIFICE	1	NN-9804,NN-9854
40		A41445040PP	ORIFICE	1	NN-9854P
41		A41575450AP	FAN BRACKET A	1	
42		A41585450AP	FAN BRACKET B	1	
43		A41635020AQ	FAN SPACER C	1	
44		A400S6660QP	SHAFT (U)	1	
45		A41795450AP	HEATER FAN MOTOR	1	NN-9804,NN-9854 (18W)
45		A41795450PP	HEATER FAN MOTOR	1	NN-9854P (23W)
46		A41806660QP	FAN MOTOR BRACKET	1	

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
47	⚠	A600B6670AP	H.V.TRANSFORMER	1	NN-9804,NN-9854 (1.5KVA)
47	⚠	A600B6670PP	H.V.TRANSFORMER	1	NN-9854P (1.5KVA)
48		A601L4780AP	TEMP SENSOR	1	
49		ANE60307J0AP	INCANDESCENT LAMP	1	(125V,20W)
50		A61884060AP	CAPACITOR BRACKET	1	NN-9804,NN-9854
50		ANE6037X00PP	CAPACITOR BRACKET	1	NN-9854P
51		A605Y6660QP	OVEN TEMP SENSOR	1	
52	⚠	A60905500AP	H.V.CAPACITOR	1	NN-9804,NN-9854 (1 μF,AC2000V)
52	⚠	A60904650PP	H.V.CAPACITOR	1	NN-9854P (1.14 μF,AC2100V)
53	⚠	ANE61424L0AG	MICROSWITCH	1	NN-9804 APH,NN-9854 APH, NN-9854P (V-16G-3C26) PRIMARY LATCH SWITCH
53	⚠	ANE6142-F60	MICROSWITCH	1	NN-9804 CPH,NN-9854 CPH (V-15G-3C26) PRIMARY LATCH SWITCH
54	⚠	A61425180AP	MICROSWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
55	⚠	A61455500AP	THERMAL CUTOUT	1	
56	⚠	A61456670AP	THERMAL CUTOUT	1	NN-9804 APH,NN-9854 APH, NN-9854P
57	⚠	A61524000AP	SOCKET	1	
58		A61705040PP	INSULATION SHEET	1	NN-9854P
59	⚠	A61785180AP	MICRO SWITCH	1	(L-2C2-2) SHORT SWITCH
60		XSWANE5+10U	SCREW	1	5X10 (FOR UPPER HINGE)
61	⚠	A62024000AP	DIODE,SI	1	
62	⚠	A62304650AP	FUSE	1	(15A)
63		A62314000AP	FUSE HOLDER	1	
64		A62485040PP	BRACKET	1	NN-9854P
65		A630G6660AP	HEATER	1	
66		A63265850AP	TURNTABLE MOTOR	1	(2.5W)
67		A64175130AP	HEATER SUPPORT	3	
68		ANE6501K90AP	HEATER HOLDER	2	
69		A66036000BP	OVEN LAMP BRACKET	1	
70	⚠	A699A6660HSN	POWER RELAY (U)	1	NN-9854P
71	⚠	A900C5520AP	AC CORD W/PLUG	1	(120V)
72		XNG4EVS	NUT	2	M4
73		XST4+5VS	SCREW	1	4X5 (FOR COVER)
74		XTWANE3+10S4	SCREW	1	3X10 (FOR SOCKET)
75		XTWANE35+14N	SCREW	3	3.5X14 (FOR HEATER SUPPORT)
76		XTWANE4+10RU	SCREW	4	4X10 (FOR MAGNETRON)
77		XWS4VL	WASHER	2	M4
78	⚠	2M210-M1E	MAGNETRON	1	

DOOR ASSEMBLY

D1		ANE0245X00AP	DHHS LABEL	1	NN-9804 APH,NN-9854 APH, NN-9854P
D1		A04115020CQ	CSA LABEL	1	NN-9804 CPH,NN-9854 CPH
D2		XTBANE4+12FK	SCREW	4	4X12
D3	⚠	A300B5450AP	UPPER HINGE	1	
D4	⚠	A302A6670AP	DOOR A (U)	1	NN-9804 (NOTE 4)
D4	⚠	A302A6670HAP	DOOR A (U)	1	NN-9854,NN-9854P (NOTE 4)
D5	⚠	A302K6660QP	DOOR E (U)	1	
D6		A30186660QP	DOOR KEY	1	
D7		A30214000AP	DOOR KEY SPRING	1	
D8	⚠	A30856660QP	DOOR C	1	

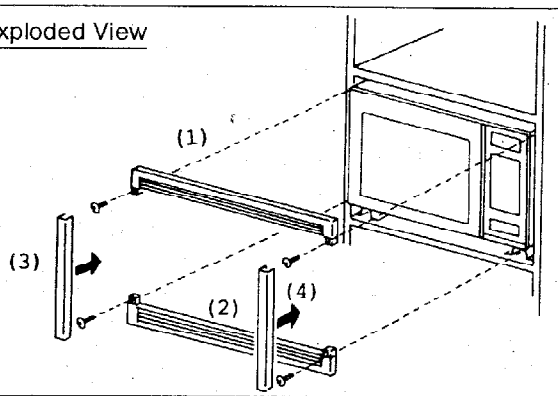
(S-667 APH)

Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
ESCUTCHEON BASE ASSEMBLY					
E1		A01576670AP	NAME PLATE	1	NN-9804 APH
E1		A01576670HAP	NAME PLATE	1	NN-9854 APH
E1		A01576670HPP	NAME PLATE	1	NN-9854P
E2		A603L6670AP	D.P.CIRCUIT (U)	1	NN-9804,NN-9854 RTL (W/COMPONENT)
E2		A603L6670PP	D.P.CIRCUIT (U)	1	NN-9854P RTL (W/COMPONENT)
E3		A630Y6670AP	MEMBRANE SWITCH (U)	1	NN-9804 (W/ESCUTCHEON SHEET)
E3		A630Y6670HAP	MEMBRANE SWITCH (U)	1	NN-9854,NN-9854P (W/ESCUTCHEON SHEET)
E4		A80346670AP	ESCUTCHEON BASE	1	NN-9804 (NOTE 5)
E4		A80346660HQP	ESCUTCHEON BASE	1	NN-9854,NN-9854P (NOTE 5)
E5		ANE80378A0AG	COOK BUTTON SPRING	1	
E6		A80726670AP	DOOR OPENING BUTTON	1	NN-9804
E6		A80726660HQP	DOOR OPENING BUTTON	1	NN-9854,NN-9854P
E7		A81276660QP	BACK PANEL	1	
E8		A82566660QP	DOOR OPENING LEVER	1	
E9		A83376670AP	ESCUTCHEON SHEET	1	NN-9804
E9		A83376670HAP	ESCUTCHEON SHEET	1	NN-9854,NN-9854P
PACKING AND ACCESSORIES					
P1		A000B6670AP	COOK BOOK	1	
P2		A00036670AP	INSTRUCTION BOOK	1	NN-9804 APH,NN-9854 APH, NN-9854P
P2		A00036670CP	INSTRUCTION BOOK	1	NN-9804 CPH,NN-9854 CPH
P3		A01026670AP	PACKING CASE,PAPER	1	NN-9804 APH
P3		A01026670CP	PACKING CASE,PAPER	1	NN-9804 CPH
P3		A01026670HAP	PACKING CASE,PAPER	1	NN-9854 APH
P3		A01026670HCP	PACKING CASE,PAPER	1	NN-9854 CPH
P3		A01026670HPP	PACKING CASE,PAPER	1	NN-9854P
P4		A01046670AP	UPPER FILLER	1	
P5		A01056670AP	LOWER FILLER	1	
P6		A01065130AP	VINIL COVER	1	
P7		ANE0107580AP	DOOR SHEET	1	
P8		A01086660QP	TRAY PACKING	1	
P9		A01136660QP	TRAY STYROL	1	
P10		ANE0169B60CP	SERVICE CENTER LIST	1	NN-9804 CPH,NN-9854 CPH
P11		ANE0192Z70BP	PACKING	1	NN-9804
P12		ANE02072L0AP	STYROL SHEET	1	
P13		A060V6650JP	HIGH BAKING RACK	1	50MM(H)
P14		A06016660QP	COOKING TRAY	1	
WIRING MATERIAL					
W1		A030A6670AP	LEAD WIRE HARNESS	1	NN-9804 APH,NN-9854 APH
W1		A030A6670CP	LEAD WIRE HARNESS	1	NN-9804 CPH,NN-9854 CPH
W1		A030A6670PP	LEAD WIRE HARNESS	1	NN-9854P
W2		A03504000AP	LEAD WIRE	1	NN-9804,NN-9854
W3		A03514000AP	LEAD WIRE	1	NN-9804,NN-9854
W4		A03536660QP	LEAD WIRE	1	
W5		A03505040PP	LEAD WIRE	3	NN-9854P
W6		A03515040PP	LEAD WIRE	1	NN-9854P
W7		A03536670AP	LEAD WIRE	1	NN-9804 APH,NN-9854 APH, NN-9854P

NOTE 3: When ordering the roller B assy, three rollers will be shipped. When replacing the roller B, three rollers should be replaced at the same time.
Otherwise the glass cooking tray may not turn smoothly.
4: Please order DHHS label or CSA label together.
5: Please order name plate together. (APH Models)

PARTS LIST FOR MICROWAVE OVEN TRIM KITS

Exploded View



Trim kit Model No.	Top and Bottom Strip Ref No:1.2	Pcs/ Set	Side Strip Ref No:3.4	Pcs/ Set	Microwave Oven Model No.
NN-TK909	A1603A000AP	2	A1601A240AP	2	NN-9804
NN-TK909W	A1603A000HAG	2	A1601A240HAP	2	NN-9854, NN-9854P

NOTE: The top and bottom strips have the same part number and the left and right side strips also have the same part number. These parts will be supplied on one piece per one part number.

DIGITAL PROGRAMMER CIRCUIT

PARTS LIST

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
BZ	AEFB22EP2002	BUZZER	1	2.0KHZ
C10	ECEA1HM102E	ELECTROLYTIC CAPACITOR,AL	1	1000μF/50V/20%
C11	ECEA1HGE221B	ELECTROLYTIC CAPACITOR,AL	1	220μF/50V/20%
C12,14,27,29	AECF50F104Z	CERAMIC CAPACITOR	4	0.1μF/50V/ -20%+80%
C13	ECEA1CKA100B	ELECTROLYTIC CAPACITOR,AL	1	10μF/16V/20%
C15	ECEA1HKA010B	ELECTROLYTIC CAPACITOR,AL	1	1μF/50V/20%
C16	ECSF1VE684KB	ALUMINIUM CAPACITOR	1	0.68μF/35V
C17,20,21, 23,24,25,26, 28	ECBT1E103ZF5	CERAMIC CAPACITOR	8	0.01μF/25V/ -20%+80%
C22	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR,AL	1	2.2μF/50V/20%
CN1	AEEMMD55511W	CONNECTOR	1	11PIN
CN2	AEEMMF03D06W	CONNECTOR	1	6PIN
CN3	AEEMMF00F04W	CONNECTOR	1	4PIN
CN4	AEEM12FDZBTM	CONNECTOR	1	
CN5	AEEMMF01D05W	CONNECTOR	1	5PIN
CX1	AEFFT4R19GWT	CERAMIC RESONATOR	1	4.19MHZ
D10,11	AEDNERA1502	DIODE,SI	2	(0.1A)
D13,14,15, 17,19,20,21, 22,23,24	MA196-(TA5)	DIODE,SI	10	(0.1A)
D18	MA700A-(TA)	DIODE,SI	1	(0.03A)
D25	AESM05DSM-YB	TRIAC	1	
DISP	A64567210AP	FLUORESCENT TUBE	1	
IC1	AEICC9573648	L.S.I	1	
IC2	AN6752	IC	1	
IC3	AEICUPA2004C	IC	1	
Q1	2SD2006QRTA	TRANSISTOR,SI,1.2W	1	(120MHZ)
Q2	2SA720PRTA	TRANSISTOR,SI,400MW	1	
Q3,5,9	UN4211-(TA)	TRANSISTOR,SI,300MW	3	
Q4	2SD1991AQSTA	TRANSISTOR,SI,400MW	1	(150MHZ)
Q6	UN4123-(TA)	TRANSISTOR,SI,300MW	1	
Q8	2SC1318QSTA	TRANSISTOR,SI,400MW	1	(200MHZ)
Q10	UN4111-(TA)	TRANSISTOR,SI,300MW	1	
R10	ERDS2TJ6R2T	CARBON FILM RESISTOR	1	6.2Ω,1/4W,±5%
R11,15,16	ERDS2TJ162T	CARBON FILM RESISTOR	3	1.6KΩ,1/4W,±5%
R12,13	ERDS2TJ201T	CARBON FILM RESISTOR	2	200Ω,1/4W,±5%
R14,26,29, 31,32,34,35, 37	ERDS2TJ103T	CARBON FILM RESISTOR	8	10KΩ,1/4W,±5%
R17,18,19,20	ERDS2TJ221T	CARBON FILM RESISTOR	4	220Ω,1/4W,±5%
R21,22	ERDS2TJ751T	CARBON FILM RESISTOR	2	750Ω,1/4W,±5%
R23,39	ERDS2TJ512T	CARBON FILM RESISTOR	2	5.1KΩ,1/4W,±5%
R24,38	ERDS2TJ153T	CARBON FILM RESISTOR	2	15KΩ,1/4W,±5%
R25	ERDS2TJ223T	CARBON FILM RESISTOR	1	22KΩ,1/4W,±5%
R27	ERDS2TJ105T	CARBON FILM RESISTOR	1	1MΩ,1/4W,±5%
R28	ERDS2TJ333T	CARBON FILM RESISTOR	1	33KΩ,1/4W,±5%
R30	ERDS2TJ914T	CARBON FILM RESISTOR	1	910KΩ,1/4W,±5%
R33	ERDS2TJ202T	CARBON FILM RESISTOR	1	2KΩ,1/4W,±5%
R36	ERDS2TJ104T	CARBON FILM RESISTOR	1	100KΩ,1/4W,±5%
R40,41,42, 43,44,56,57, 58	ERDS2TJ330T	CARBON FILM RESISTOR	8	33Ω,1/4W,±5%
R47,48,52	ERDS2TJ181T	CARBON FILM RESISTOR	3	180Ω,1/4W,±5%
R50,51,59	ERDS2TJ430T	CARBON FILM RESISTOR	3	NN-9854P 43Ω,1/4W,±5%
RY1,4	⚠AEG5J-EM12B	POWER RELAY	2	(12V)
RY2,5,6	⚠AEBG5B18P-1	POWER RELAY	3	(18V)
SPACER	A62647010AP	SPACER CUSHION	1	FOR DISP
T1	ETP48SFC43MU	L.V.TRANSFORMER	1	
Z1	AEXBM5X153JT	COMPOUND-RESISTOR	1	15KΩX5
ZD1	AEDZ5R6ES2T1	ZENER DIODE,SI	1	RD5.6ES2
ZD2	AEDZ24ES3T1	ZENER DIODE,SI	1	RD24ES3
ZD3	AEDZ4R7ES3T1	ZENER DIODE,SI	1	RD4.7ES3
ZD4	AEDZ4R3ES3T1	DIODE,SI	1	NEC/RD4.3ES3
ZNR	ERZC10DK471F	VARISTOR	1	(470V)
ZNR2	ERZC10DK182R	VARISTOR	1	(1800V)

SERVICE FIXTURES AND TOOLS

EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
	AT40P004	4 pin Extension Cable	1	Cable No. 47
	AT40P005	5 pin Extension Cable	1	Cable No. 46
	AT40P006	6 pin Extension Cable	1	Cable No. 48
	AT40P011	11 pin Extension Cable	1	Cable No. 50
	AT40E006	1 pin X 6 Extension Cable	1	Cable No. 9

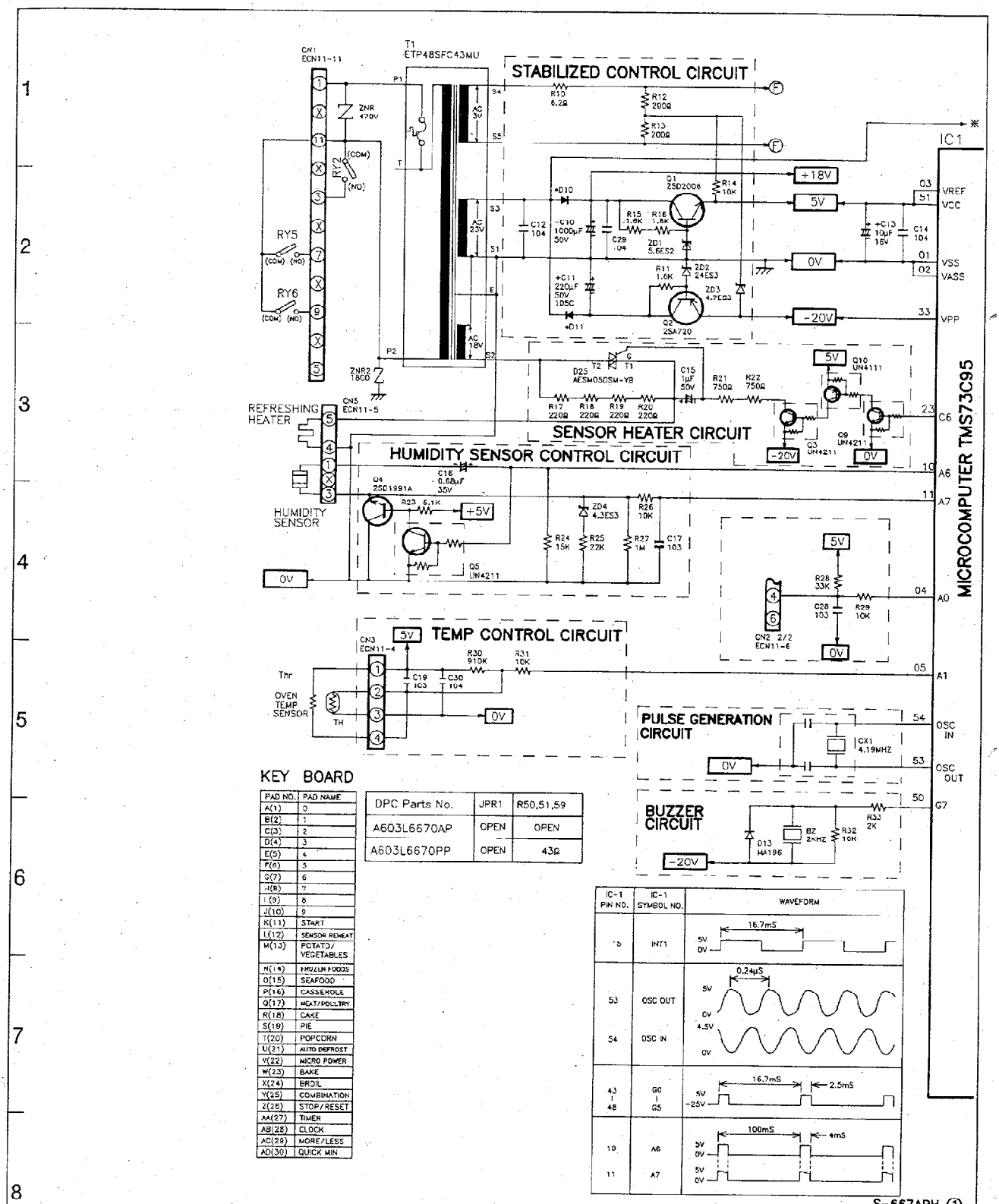
DPC COMMON CHECKER AND ITS CABLE

NOTE: To be used only when DPC common checker is available.

Ref. No.	Part No.	Description	Pcs/ Set	Remarks
	ANE600ZK70AP	DPC Common Checker	1	
	AT30A6660HQP	DPC Checker Cable	1	NOTE

DIGITAL PROGRAMMER CIRCUIT

SCHEMATIC DIAGRAM



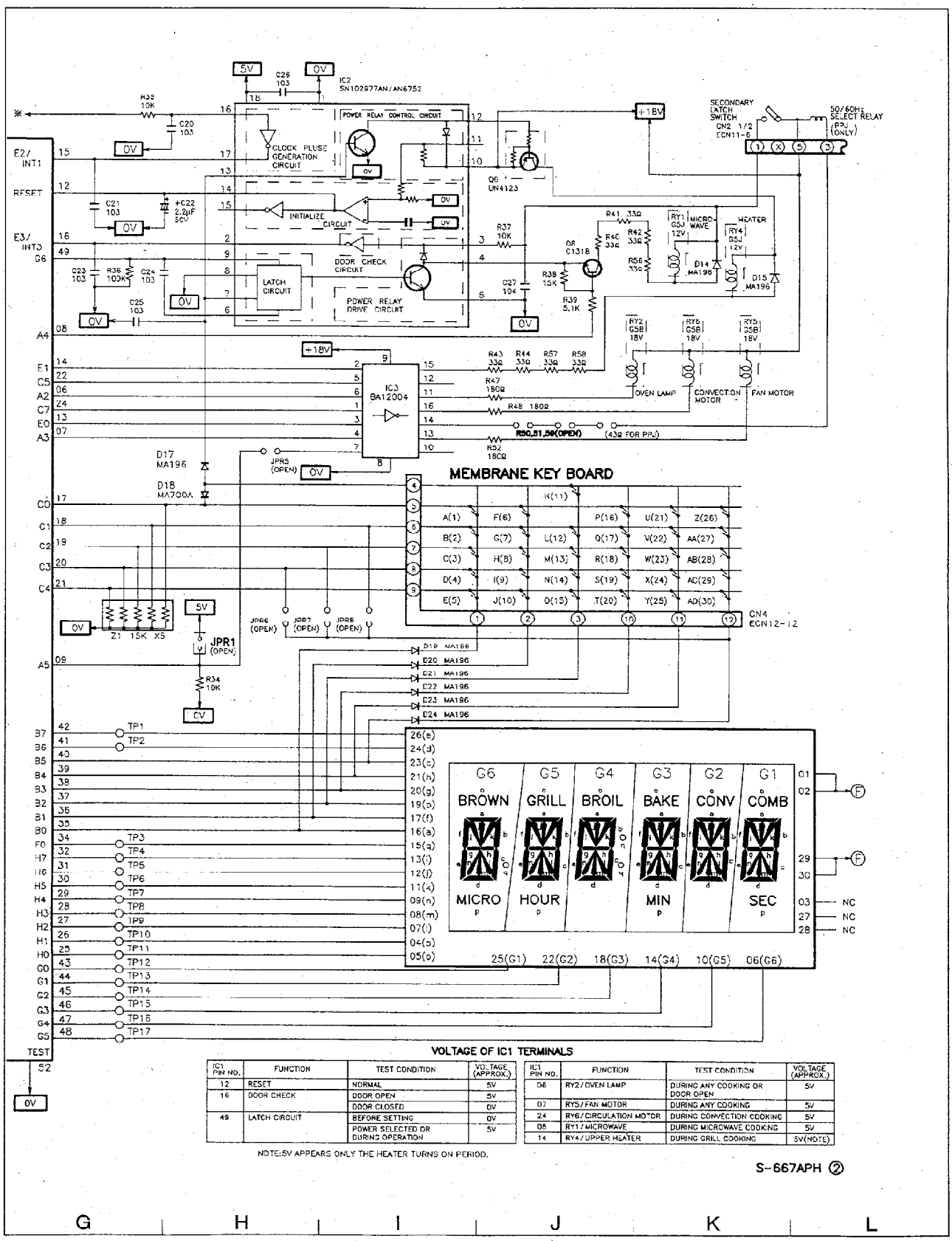
KEY BOARD

PAD NO.	PAD NAME
A(1)	0
B(2)	1
C(3)	2
D(4)	3
E(5)	4
F(6)	5
G(7)	6
H(8)	7
I(9)	8
J(10)	9
K(11)	START
L(12)	SENSOR REHEAT
M(13)	POTATO/ VEGETABLES
N(14)	FROZEN FOODS
O(15)	SEAFOOD
P(16)	CASSEHOLE
Q(17)	MEAT/POULTRY
R(18)	CAKE
S(19)	PIE
T(20)	POPCORN
U(21)	AUTO DEFROST
V(22)	MICRO POWER
W(23)	BAKE
X(24)	BROIL
Y(25)	COMBINATION
Z(26)	STOP/RESET
AA(27)	TIMER
AB(28)	CLOCK
AC(29)	MORE/LESS
AD(30)	QUICK MIN

DPC Parts No.	JPR1	R50,51,59
A603L6670AP	OPEN	OPEN
A603L6670PP	OPEN	43Ω

IC-1 PIN NO.	IC-1 SYMBOL NO.	WAVEFORM
9	INT1	16.7mS, 5V, 0V
53	OSC OUT	0.24μS, 5V, 0V
54	OSC IN	4.5V, 0V
43 – 48	G0 – G5	16.7mS, 2.5mS, 5V, -25V
10	A6	100mS, 4mS, 5V, 0V
11	A7	5V, 0V

S-667APH ①



VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
12	RESET	NORMAL	5V
16	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSED	0V
49	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
06	RY2/OVEN LAMP	DURING ANY COOKING OR DOOR OPEN	5V
07	RY5/FAN MOTOR	DURING ANY COOKING	5V
24	RY6/CIRCULATION MOTOR	DURING CONVECTION COOKING	5V
08	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V
14	RY4/UPPER HEATER	DURING GRILL COOKING	5V(NOTE)

NOTE:5V APPEARS ONLY THE HEATER TURNS ON PERIOD.

S-667APH ②